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SCIENTIFIC AMERICAN

The Monthly Journal of Practical Information

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Why Kelly Kats are chosen for hard jobs

"When we have a particularly hard job to do, we always give it to one of the trucks that is equipped with Kelly Kats."

This statement, made recently by a big fleet-owner, indicates how highly Kelly Kats are regarded by truck owners who know various types of tires.

When the going is bad, Kelly Kats take hold and walk away with the load; when the road is rough, they cushion the truck and protect the engine from bumps and jolts; they stand punishment that would send most tires to the junk pile and they deliver mileage which makes their purchase a genuine economy.

Kelly Kats are chosen for the hard jobs because they are able to do them.

There <u>are no</u> Caterpillar tires but Kelly Kats

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This person about a 1200-pulse feel oil tech track on which Kelly Kere were specified as original apalpment. The traction and enderance qualities of Kelly Kels make them particularly well



Why Won't It Work?

NEARLY solved but not quite—us what the inventor socions perpetual motion invariably finds because Finaton is one of the elements which buffles hind Metal gunds against metal, bearines must be constantly cited and ver—se

Avyou look into your plant wheels are wharling and the scene of activity makes it appear that maximum production is being secured Box, just as friction mixes perpetual metons impossible, so plain bearing transmation equipment is taking a large portion of some power. rom productive wirk—through fruiten

Skipef Self-Aligning Bull Bearing Hangers practically eliminate traction and reduce high labricant and maintenance costs. They remove the unseen hand holding back your plant from operating at its highest efficiency. Our engineers will slow you why they pay for themselves SKAYEF



THE SKAYEF BALL BEARING COMPANY 165 Broadway, New York City

The Kunners America, Job. 184. Venez III. Preside the reside in Neutral America President Company of 200 Strains. No. 1 set. N. Y. and record a fir U. S. A. School and School a



The sturdy 4-cylinder Autocar

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Permits turning without backing
in average street

Makes deliveries case in seem.

Makes deliveries easy in seemingly inaccessible places Saves gasoline by reducing juck-

ves gasoline by reducing jockeying Saves time inside industrial plants Delivers construction materials right where they will be used Saves time and space at loading

platforms
Relieves terminal and wharf congestion

Saves space in garages, on ferry-boats, on elevators, etc.

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| Direct Factory - National Services "Benches or Affiliated Expressentatives In Interest | Services | Services

Autocar gas and electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

With the Editors

FROM far-away Alaska comes a letter which we would anote. It is signed by A which we would quote. It is signed by flow, John W. Chapters, its charge of the Christ Church Elbekot, Anell. Anells is 200 railes up the Tuben, in a peculiarly traceweible heation. Dr. Chapman writes. "You may recompler having given on correspond to a ratio founding less than a year ago. I am glod to be able to report that the infact began to walk akme last night, other nowages nero rechanged with WUT at Holy Cross. It is a great ratiofaction to us, that we are new in two-way representation with all Our clocks are regulated inday, he they signed retain less night. 'Raile for Keeybely' pat us as the track.' An eccurat which no night male upon this letter is superfinent. Its.

Chapmen law sald it for me I've lappers that "Radio for Knoty-lady" is a Streeter Authories back which has not with a phonousual or Originally invention to a guide house for the business in raft, this had bee because a test back its secretal schools and religies as well as in the United States Navy. The first edition appeared in March, 1922, shartly after the birth of radio broadcasting. In an effort to keep with the desired for the latest avail able information on apprinting raths. this look has been recised several times and regiment no less than eight three Recently, handers, the residues became on heavy, due to the convicting progress of radio brooks-tibe, that I' has frond terrovery to provide the entire work from die for Korrbeit" stil skoth be

T is in order at this time that we say a need regarding the Sciences Assothe Schotter Assan at service to our peterally in the form of supplementary reading, representing, or they often do. the exceedings countries from our columns. Thus the subject of radio has been onered in a general way in the culturate of for the laveled theories and specific de talk of ratio has had to be and in a supplementary publication devoted on-firely to that subject. The man-man le-mid for the home-hubbing field; numerous general articles on the various phases of home-building have appeared in this jour-nal from time to time, but the decard for specific details has been not in our supplementary publication, "Releasing American House Owners' Handbook." The full account of Mr. Bird's prochic advenfull accessed of the HIGEs payeline adver-tices, together with his lengthy notations, has overfirmed the space Emissions of this journal and pure into "My Psychic Adventures." And there are many other cases of a similar volve.

All three supplementary publications A as well as any and every book deal-ing with one or the other field of technobegy, is available to you through our Book Department. Our also to secon would not be affaited wire we let pre-pared to supply you with additional in-fernation on any subject in which you may be particularly interested. So, if you are in search of knowledge of one form or another, just place year problems before us. Or again, if you have magnetises for new books or even reasonable, please do not heelinte to schmit them to ege Book Department.

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Mora & Company, 233 Broadway, New York ORSEN D. MICHAEL PROGRAM

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Fring. 19 provide a cold. Eath is year. Perhaps they provide in Uniford States and Innovational Marcine, Uniform cold Presents; 1910 is year for Canada. Purelya entheorypistes. IEEE a yearhap provides.

A NOTHER letter which we shall quarfrom other of the few Lange of Assertion astronours. We had planted to sensoret Mr Harringer - story on page 10 with of efficial "lon," estimating the play which this contribution should be given it the wiestife literature of the day engaged entrappient des this so well that we can find so work befor than his, and we preventingly give them with stufficially verteries in the next paragraph

I' has for some time been practically noticed that Motour Chairs in Articolois the to the impact of a large meteori-elder. Bereitser had done very good work in furnishing data on this subject (The editor seight resears here, on his one required billion, that Barringer has yealthy proof beyond myriting that he been pathlebed.) When he attempts, has ever, to profite Province, old theory thy the later craters are shallarly produced he gave beyond her evidence, in the judg Sewest # of next astballing give will agree with him, but the server carry who have seen the proof under the ticelty a unit carried bits.

th surely for our emercusyably abstracted Sit terris for our measurements and house Suctionity Speaking new stricts in the equality of the editorial We, we would remark that Mr. Eurringer presents the arguments for his theory better than my hear seen flore numberlied by any of his probressers in its expectables. theory than has mer been made of the before—else we had not given him space to make martifulg out of it, introveting as his paper is. These resiers who wish to needer the exidence fully from both sides "Loner and Reseation Physical Postures Marries Aren Amil 2001 and 5 lirigies of the Lonar Pormations," Pollivelens Astron Sery, Portfe, 1920. It is see over telepools, as well as that of see our nom judgment, so well as that of ser-ctual scienties of distinction in warker fields to whom Mr. Berringer has salt selfred his paper, that he brings up price which must be disposed of before the throny of selectic origin of the ham notes our witte back late une

Tier hig experiations are throughly subon the proposition that it pays for itself, and this is no recurries of whether, as with the tungers flament and the gofilled intro. the trealts are of obstess prioriability and inspediate count rates, or whether, as in the case of the researches of a Laugustir into the struc-ture of the atom or those of a New late the nature of light, they are merely as addition to our fund of theoretic knewledge. Schemerindy and Herbester are first arbierometrie just mentioned; but Law hauds of a research laboratory, alster to the one of Schemetsele, which now recomforward with a discovery that saigh fairly by estimated as having greater to tential recently to all the industries and all the scientists than any other research arbievement of recent years. We seen to It is more. You will dud it on recy of and Whatever year broiters, or profession we will find in it some supposite for

Announcing the FEDERAL-KNIGHT



The Federal Knight is powered with a

The simplicity and efficiency of this shore wishe easily in two bean simply desponanced in this country and abread. The Willys Knight engine by masses of the design, will be presented in the design will be a design with the present single the country of the present single design and increases in power from one timed operation. In the labelity are successful and a superandor and automations.

The Federal Knight establishes new and long striven for dependability and economy in light, delivery type motor trucks

Designed by Federal engineers with a successful experience of many years in highway transportation with a strength and naggedness of parts unusual in this kind of truck—and with the marvelous Willys-Knight steeve valve engene—this Federal Knight is indeed a wonderful performer.

Economy and long life—questions of operation—ease of control with responsive acceleration under load—hill climbing ability—a maintain of mechanical attention—all these and many more features are assured the truck operator with this Federal-Knight

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FEDERAL KNIGHT is the lowest priced track of his type means included to lay if you will company it pure life part with other light tracks you will further real too its remembable when \$100 for obsession only in leaf POP

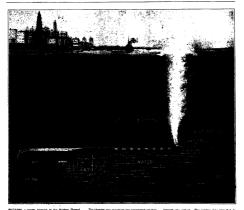


FEDERAL MOTOR TRUCK COMPANY Detroit

SCIENTIFICAMERICAN

THE MONTHLY JOURNAL OF PRACTICAL INFORMATION

NEW YORK, JULY, 1924



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A New Miracle Mineral

Our Recently Acquired Ability to Fuse Quartz in Quantity, and What This Means to Industry and Science



ACING When the mate state figured as the strate west in most time against a the strate west in me in med per power if only we had complete freedom of colors budges one workship, mechanical strength (severable changeal and clatrical properties—these are the simple of platform risk, and this is do at 1 to in reliant square in the production, but is the short and framapable matre. There but to the confescintive cases a title of the then which we should mente if my way to use

It for all the purposes for which it has observe been the most designed projected What shall we say then when the other of particular as mirerie material is recepted by a substance which is the most contexts of all relationship. What shall no man when held that they need the best the five expendent then plottenes and a bulber sailting point. A hard been discreding photocons and electrical properties did from those of the netal but pure the how value A chembral inertness equal to pintingers and besisting properties suce nominable than platfaces And what whell our positions in when on top of all this is piled the eftractor's fact that this Se telsenal is more transported, althe in degr

and in kind than the level glove? The mederful substitute there the eful substigue their characterized is a were finalise friend. It is quarty took error if edition distrib, silies NO, In created and assemptons and describit wide use of record years. It is no discredit

cuttive const—the supply is liberally incomments to have alse not known the properties but we have best mailed them on any mak become the melting point of quarte is so high and its bandson so mixture and its greeni producture in the form in which it beyong to he so since, that we have t over here alle to make to true it was at implicate sweeter It would be purhaps a lift embracients to say that this problem has been selved. That is shop way of triviles, quart has been found. But it would be entitude within the facts to may that a may of treating it in quantity has been found so much obsept than the If not that it is been possible to me qualit wherever quality is the prime equipment and price onto a vices of sports could be under all, he a process of legal a of he, in the occupa flarary a process of him in lead able th ceitars lakes of the gips denote the children they believe of freed organic bose less with exectal three their weight to pold taken it initiates are more united to a faith fair, a marginary of garde

is needle for the nettado more to also ones along the Profestion is presided to the big factory in figure. make the motorial evaluate when ver at is model taset. O'ln leady the metalian of the problem is a personnel. unities the case with pictients there can bever be The ordereding merit of class famel quarte, as the new material will be tailed to be wealthing reedlesses f expansion. It expands such one thirts fourth as intel wanger of war statement as much as plaining.

frich would up and barres com under the profitation of less us commend with quarte A quarte red opbut lette haned the such 1800 degrees hakewhell will happing only seven one thousandle of un inch This course up a mick when in two directions. Article of quarty will retain their size and shape and hone their precision qualities under repealed hearing a cooling for letter then of am other known schelar and counts shapes under application of arthress has will fracture far less freely than one other materi will tracture far few theory flatt one other fasterial over known or demand of . A fain quarte tube one hasterial point of sold and practically noted to sold and practically to its own melting peter, nive planted industry late old unive-althout donage! At the Lenn decemtion a fire weeks up a quarty tale was tested upil

and in 10 little property can, where install to considered yet a conditionaged into cold season figure, beauted take of the season figure, beaute take of the season figure, beaute take of the season figure.

After its unter indifference to extreme heat a After its urise buildnesse to extrasse best and rapid chains of interpreture, the insportine property of circ field quarts is the treasposters; In the width spec times it translated for pre-cets of the energy that chain upon it the very best spring given to per cett. gives of the energies on garden withly 30 per cett. After the country of the thirty fill pre-cett gives punching opposing, quarter is pre-trackly fill pre-cett punchings opposing, quarter is pre-trackly fill pre-cet-tomispassed. If translation the defire species raises, from the langual track and to the substantial raises? All extremely next stemmetration of the transparent, of quarty is made possible through apother of its goal erties there half a charce, I tobde to from a reserve course of restrictive by the territy descioped po loss much a son fare, they not an perfect mirrors, buth for light reached them from withred and for light from within lighty if light he introduced into our end of within Henry If light to IMPointed mrs car row or such a red it can be more get set than water one go out of a gipe had in reflected back and forth inside the rod until it reaches the other end. Here it encounters a reast surface through which it on sector The resequence is that if we call of the red be preis a some of light the other and will shock the nex-licit in all read like property position seen through the red be corred. Not only one light thus be rated to true a cover for reddillity suppose but the rich, is of actual writing in introducing light into an issue-ssive place. The new filter of a foundar, matter till be first interesting diverged a right point; or tensity, for first long, alternate with a first point of the place and be stelly spage. This is a demonstration that there this is before against them are supposed. to a sure of lists the other and all shoot the read cared noticier and that gains high apprecial from a amphisticated one

men a separation of all the separation when heat rays take the piece of the visible ones. You can hold one sent of a quarte red in a high temperature dama, grouping the red in the middle and brilling it indefinitely without discontine. If I grad the other red, however, I shall out a handware large from the boar transported of Fixed querix is also the most perfectly elastic sub-stance known. If a roal or take of it is best or twitted out of shape (always whitis its fractaring limits) it will return exactly to its farmer state, no mather how







There examples of the remarkable true ency and allied properties of waste

ed, with no sign geing to present difficulties. It has always be to bring querts to the fusion point in the le deine to present diff. n flame, and to shape it more or less after the m of glameblowing. Her its consistency at the extures then attabable to such that it cutted by tain masset shapes of any size. The tecknique to in piering tegether small sections of crystal, or ing allies product from time to time, and the rate therements are always defined to the final edges, so that a large tube, for instance, has the sage apprairs appearance of an intestine. And in addi-so to this, it is clearly a very sine and expensive

then to this, it is clearly a way show and expenditure, process this is a vasher shapes of oils great sile. But hand-table quarte is zow clearlessont. When it is desired to wishest bond-quarte of the quality libertonic in our picture, and to it is necessary to make with the very lighter greate of zow matterial. Of this restricted were in the control of the control difficult to make high-grade fused quarte from sensi. used at Lyan is imported from Breatt and remotion

we as again to properties their properties of fundamental per common o But the surface is often successed with incisaide and other ferrige nuterials, and the erystals sking in sold, the other by leveling up the expension

The next step in English, in an electric farmer. For fuelzg quarte a graphite crueltie in necessity, this being about the only exhibitor with a higher rediting point that the quarte itself. But a closule might be targeton for reciping to its it, either it is so entries in renters that the silies and the carbon will react to from extensions (ellipse carrieds, NC), with release of oxygen. Mesons force; and levers, of the thetered Laboratory at Lyon, however, went through with it and diagrams; that the curburations first Served was ledd shown over the surface of the graphite cracible, and that we seen on this was completely routed over the action between the effice and the est ive apprentically much

To recent colds in of the crackle (the material of which reperies without positing at the fettier serviced), and to minimize the Sensetire of holders in the act allos, a high vacuus is personny in the fur-But since to vocase is perfect, and since in our count was overer will be released in the ferner the of the protecting rest of nationables, lebbles will ever; so the success treet in followed by high preevent; so the necessis test to retreat up man pre-sure to elitable them. For the formation of refe-end tubes of query, the soft instetul is extracted through below of preser dissector in the bottom of the furnace, with se without a cure as the case may be. and for these shapes the forestary pressure to eliminate serious trouble with hubbles in obtained from the prophics phone that forces the photic mass cut. sticks off at the proper height. The silica remains in the farmer for about 18 interest, being heated to more still degrees Palacenter? It then energies with about

the consistency of soft taxismen coafty, and noty rapidly bandons to a degree that prevents discretion. It is tically free from babbles but because of limittee sions it easy be necessary to rework some of it his will coffine if the done for the unual beach on



eds in the caypen f per priodice of publishing f cerem envilone the

ing or mobiling to out of the For legace and other per-poses it is often present. to amount the spens is a large black. For this 21 is level in a furtisee of differ est type, with high-pressure the take on well us their As med as fixing is ever plete the mectage is out of mi the presents in the task is brought up to who ive may be necessary. The tubbles which are present in the name laws been furned in vacuum, are of low pro ear-themselves, and col-

sing of the court spir.

under suffring squeeting; but even so, the per used are such as to strain ingrestly is the drain of a furnise head that will a further hand that was come of for classing, yet will be got tight in use. An inversely fact in this connection is that in the head as withoutly concreted, the addition of a single from

deg quarts rods and table by est electric furnace, under high pre-

If the clear fixed quarte explit he produced to suffi river quantity. It would probably become the connection of all materials in use. As it is, the factory actions still particle so largely of the characteristics of lab topy work that great quan-

> the cost will escondity suit the descripting forter; and the makers of the bew sesteriei will discourse its use wherever the adrab not sufficient to justify the said reprise The place where this condition is most riesely net is in the con rains descriptory. minths of term been and

ly became of the best of released, which denseate serv neck and frequen tree to amid persuspect de funcation through report dos, and to prendt accords ent of the figure the is helps attribed. ing courts. It will be you



Leases, prisms, cubes, etc., of clear fused quarts; for the most part there pieces were shaped by grindles

without interruption. Further, the tern would expersign and emitweller in use will disciple the distortion of brown which is your the Bestine factor in the six The precisioned sord from between and mirrors intimise" is employed by one endoor netromore to

clustrated the swatter upon his without with will over from the provent introduction of quarte in telesenses and release. Marytowers, will benefit as man direct observation, because of the master in light through abscribes within the releas or well as the grouper range of specificacycle electrotics which will be onlyyed with prisms that handle ultraviolet as urell as nieffile more lengths. Porticularly there will le Important new work with larger paless than the Perhaps the Bent most important group of applies

tions is that which arrives out of the transportery of courts to the ultraviolet, reguled with the fact that are the most personal pressible lawren. slidity to firm then lest to by the queta less will here wide me in textens and medicine, and the ability to have ultrasted light ledocs, through quarts win-The trick of passing light around inc a curved red will be of raine for direct internal appli-Three site but a few sugcation of sitrations light potions for the wey extensive applications which will he figure for the new "gloon" in all branches of health wring: for it is the only material known which is obbineble is amortiv and which is transported to An industrial use of importance will lie to the naimplicate inchestry. The plant interest and in location

penalty crack on first her, under the intene heat of the faceout lists. Couldnessed like \$25 they are used in this crecies contition matil they fall appart (in the other end of the line, in the projection man, the steam letters with a proper electric bentry of wen the gase series, crick at the rate of our lets per day we smaller, and there that do not one lets per holly pitted through reportaction of their gare value constituents. In both departments of monte work the quette been to the steeple solution.

The same species of personnel discretion folioring frequent emphysion and contraction which shappes the tity production will appear frequent repeateds and contraction were assumed astronomer, arrive again in the use of plans theritagnostic actions again from some (Configurate) to De degree, and then broade lack to gen, will here less so deferred by the process that on se contact with the freezing point, it will register ong-where from 4 to 16 below. No gines there sawter that is exhibit to rapid or extense fluctuations of texasers ture our receip persuposity average, laded, the process is a confiltrating care, so wards a table common rece regards consistently inaccurate. But effects under any

condition, this rearises the citizen of objectionality, with the citizal increasest. The sparts theresavers, on the other land, will have a recognized figure and a have fixed for quarts; there are her of places where his law expenden or other characteristics all challe It to reviser metals, the imposper letter sureh its

eldenat. For hanging, there is the nutter of the ich plack, it must retain its physical figure within vernarrow Halls. A firsk of sire! will very in iregil and letter in nitch at different treaspractures. (Contented on page 59)



laboratory at Dayton, Ohio, devoted exclusively to research work on the automobile is over 1998 feet long and 486 feet wide, with more than six acres of working space Artist's conception of the vast research labo

F WE could rate the unade tune and wish So the citizate is actorobles, the result of our wish might be wountaine like the that 100 payers, a few facts of page plant, embedying a lighter but more exerted regime, with lower fact convenience with labelestion that would be practically antennic one that would include frictionless learning in improved to places; ellectrostes operation, size to perfectors to shifty of "knock," through the nee of treated t than any presentates car, with a address of require and solbetoents, and a marchines of religion and nices ing service on the rocal, and a finish that month stay

Bes with little if any care That is what all of us exentually seek in the way of a aptomobile. We do not positive it until we see these specifications in cold point. Quite limited life, we have become beauty of loss suffered with the unfresolitie of bidg leave, it compared with the tobicle of our feedens, it is a nativeless place of mediation too, there is nothing better in sight. Little wonder, us a highly perfected product. Next of us do not expect ments and womber improvement specified for their believe tree, with false, marion lights, organized hallow two, with falsk, contine tigate, organized controls in the special wheel, and so on. As for the lard features or traductionals, we have come to com-

sides there established and here to start Back to Fundamentals

Mestablife a little supplier rate is letter armore for our benefit the of the outstanding research sind-teres of this up: his been consequentlying the automobile and assertaining were rather startling forte Charles F. Kritering, associat in investment engineers Is charge of the number acctions of a most recognitive

restory to which handreds of met un expand is notable antiquolitic down to its very This charry andredies has recaled the neiber southling fact that little in the present-day on trapidly design poly on a weersty legical lards general, the automobile is starely a referenced of the crade librar of the plant of have continued to do certain things in the same old ways

serrir becare he one regeneral three ways And the wood domarketistic New comes this rust or minutes, with everlenting

eer. It was one of these on who saired who the

calmodific might list to be english by hand, and gie agenced his own question by investing the riottic wif-states. The same run arted who the femore and the most beau mold not only the constant entratives of electric lights, and by answered that question by developing the connect granitae-driven prompter for homestade electric lighting. And this one Settering is now engaged to suiting more uses they than over, and answering they are by one with the sid of a curpe of skilled websiggie and with the ated to assistantine and associated problems. No role is a period wetherly divelop from Day-les, this, will be feed the set and increasive workdue of the tirtural Motors Records Committee intersteen—a med building over 1980 feet king and

400 feet wide with the equirabet of more than sto acres of working space under a single roof. Here are eptional facilities for governable experimentation by there are dishifts to not individual consequentiar or gastration. The ratios plant is devoted wistly to re-warr's north. If there is any magnifestating emparted with this establishment, it is solely the manufacturing What Is Samuely

Under the direction of Mr. Methetty, these are, in all were feer helicited engineers and worksom engaged in categories, each as mechanical engineering, farl engi-avering, chemical and metallengical control, chemical and metallargies) rewards, electrical engineering, dysands, and searles to below fate amortimental tradutive, weni-works recinorder, and sortal problems Early cologoty is assigned to one section under a com-prient older, and all efforts are co-cellulated and dellfully bleaded in order to make for the best own To the envelop task, research means little. To the

bearied alchesist of auditrial times, pondering over builty books and studying the ewintions hades his circularly server. Again, it may being to mind the pur-siling troublets of some ideals's meetaling forms of rewearch, such me love every said there is in the ladies Green, a conflictated page totate on pleweling de sizes and how much sell they displace, a report upon the constitutive determination of contin by many of the spectrophotometer and the coloringter, and other results uninteresting decaretty which, to the evenue on, were such a waste of volumble time and effort Som in the highest healther choice the rest meaning of sealors research is not fully concerneded, with the result that young a product to endly larking in prope development and more a numerication finds his year bets slipping come from his frence firm grass. Rescutti is a very necessary factor in every way

uninformed layoust it may every a dash-back to the

ful tradpose, no restier how large or low small it teat be. Besserch potent the way to Improved produ Breezech cuts down manufacturing costs by simplifying and perfecting the product, and by weaking out better production methods. Research steadily improves the relating product and develops new products, as the the namefacturer may keep abreast of the trade. Be fortuner. Research is an investment which returns his ridends; present, property conducted, power costs

noticy when the first behave is street.

Now at this research biscourtry the reachthree, the inseparates—all new lay purdeticis which measure how severably the healt factory has produced a metal result. Thoughts are firings. Fundamental tracits are things. These to taughts, brisible forces may not be perceived by the five senses, but they are the things which the reasons laboratory deals with. The reserve man new get a first group on en al

street tibes and translate it into words or affects it of a place of paper. It has then assumed tangible shape that may be prayed by a fire seems. Next may be irroget into play the restrict pice brain-power of other workers. At this point ma-turial things like wood, cap per, from are fabricated to chal expd.

Let us carry our simil-back to the man who fire onceived a pair of scissors after he had finally worked the idea into shape he tool the idea into shape he too iron and made himself a pair of sciences. They cut We say we can see these cut. But we can no more see the force which makes them cut than we rould have men the crase idea of the man. What the inventor of the sciences did was to utilis leverage to produce stroring. It was no successful its application, and no



One of the many testing rooms in the research laboratory, where motors are operated so the test block

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the taugible science, which the creater worked out in the mental blacksmith's since. Trains that is the kind of process going on every day at the great presurch laboratory in question.

Pite rewards expected their with establishing and combe arteriales. Experimental research or equipme ing, the second step, is nevertaining the utility of join ity. Production engineering has to eviden methods of association. The work of the Englan laboratory erathere steen. As It is refreetly a conservate sech Invitation devoted exclusively to obscinize information for the use of meansfaringing and operating units comprising the large affiliated experiention, ever effect is directed toward wave metal end, natural imity extering products, and tream creating better

The Automobile in the Test Tube Exercibing works down to the elementary fundamatter him conglicated the problem, the wittes will be simple when fruid, we are held wise the successible was prising in the research new to this yest laboratory. It was wallt up into its varieso recognizate and each congress was sociated to our department for judestables study, criticies, experi-mentation, and ultimate development, if not mentalled perfection. Perfection' That good is takened by the perfection. Perfection' that gives is increased by the Nirange as it may seen, the suscensibile, which are have evene to look agent me sign's a splendfd some of work, presents plotty of need for consumt income nent when analyzed by those lumbbroded techniques. Taking up one frainty after aportion, they neet size that virtually nothing in the present more fruity rooted. Nothing is there because it is the best retents to the desired end. And, looking matter carely from the fundamental physics and chemletry ignolved, these consums non-continually see the posibilities for york Supervisions. Henry their unpossibilities for york Supervised St. Hotel Met us reported work have staled was, and the resultant better

and more werful utilities available to society. It was a Netterlan investor not so long up- when the wetter visited the use laboratory and was should this improselyn establishment in the oncollecting registers, where function is clearly indicated his title. Later, Mr. Kettering julged our party.

are to be found. Ever since its insuperation the laboratory less been experted in all tive study of combine The problem law here to fad ways of increasing efficiency by getting more of the power out of the gamfige and into the your wheels. Automebiles new hove ker-compression engines stilliday under best condithem but 10 to 15 per ceal of the energy in the gardine When the goodler and all are token into the cylinder and compressed fast before the explosion, the pressure inside the culture is refutirely low-shoot 50 pounds rate could be doubted it week make possible a cur AND TO INCOME TO LODGE LID the revent his constroated

some of the interdistr or some of the interdistr or solts of the scientific work.

regime is pulling under full had, and expectally at low ds, as fer testages uphill be blob mour there in the tendence to knork, which dormuses power. And if preshe med in high-rouse statem this brush not only erues all the time, her also be-

leat. Heranor of this knock, high-corporation engines are not practical for nationables using ordinary contherein gasettle.

The research engineers went to work to have what conduced the knock. They frend two distinct explosions in the engine cylinder as the result of an inplied gasethappe. The first explosion is so tenden and violent that it simulates a hazaner blow on the platon. It is SCIENTIFIC AMERICAN

this emission leaves as the desputies, which were The second explosion, wrongly times skewer than the first, is the explosion which we harpen and convert into power. There being to feasible way to harmon the first application, the obtains accombine has term to distance of it or at least returns to sting. As the result of them extender about a few row rigitaves have developed obraskal recipencies which mined with the possible, eliminate the preliminary on shador with its issues and negot the new of excesses

hing fewn one of the corridors in the research laboratory building, show lost how each section has its own walled-off source

tine in high-reconnection over high will develop power again to the heap, began, lesefficient regime terr in use. It will seem in name that the classific can be lighter, and that, remediated inpopular feeting timete heave-prient cur-

The writer was about the case of the know and her it craft be eliminated by the ethologic fluid or "Supe," A small gardine-decide high-conservation (gif-



Bessarch engineer weriging out the characteristics of a gasaline engine on the

for large lighting was operated an the small provide, soried out of a test tale. The studies developed a had The sa meter showed a remost of 25 sears Then, where the first test talls was replaced by agentler establing "Suped" preside, the knock seas disappeared as the test find maded the establishin character, and the surpers reading rose to 26, showing how great in the power-how in the knocking engine. my exercised problems had to be solved in connection with the ethnicon field. Aside from that of note: was the problem of artifax the "abov" little the mostof the metadet. The legant solution of this pendica was to place the supply in the hands of the gradual distribute, who in turn could distribute the Date through the send gos states. But he second to the highermoression engine that peeds the dear will be on the read stde by side with the learning

> tear to run enceible and b of deplicate underground tente at the filling stations called for the druct county of a degree to desice, which has taken the from of a small outlier. scame to be required on the stendard gar penap in work a "riksf" directly into the go-

For each gallen of the the agaillant people cranked to discharge a a solide table and us the streether to delivered to the precision in argument of the later that is discharged into the That nesty these known

"ruries" has also gets into the prescript's test tale. Much to his structer the depends which respect the racter to become closed on regate to become conserving se his power and kneek on bills, proved to be several ther thinks besides carbon. The christers of the

seculted "curtest" divised that the chief offender was a few-relative binder which held the mass of road data terry substates, and true motion in the militake, soft from the last Same of conduction. So the researcher creates by described a winner for the hilber. And perhe are to have a carbon reasoner that really week

One inequalful in such cylinder util beek down the binder, and the hot flares of combustion does the rest In concertion the line curben and the terry selethene the gars which are carried out through the

other things besides carbon.

Renging Care to Destruction One of the waveral years described of this laboratory is Jan a big carner, conducting read trets of springships in this section the drivers and torclassiclairs are greated this cross working day and blatd on regular shifts. Ours produced by all partitioners are continually on less to obtain facts which are pandthe bods for significal contrativity A trained med closely is \$1 tiles of send and de-

pured businessed, rith effects, good contries rooms poor thing the average motor car neer will encenture and tunker on black belongerers too The attimiselyles are given the best attention has are

driven hard and referality watth rivery break deven. They carry full lead at all tirees, sold bega letter used in place of the head-land parentgers when persons se the car is busied into the stee and pel Each our in three names is not 25000 rate and is flore below down for complete experimental and supposeds the work It is interestible to see how the eyes fore orater such

conditions. The uniter was slewy an eye than contrib rated of into extints and latetal for the major features of the automobile and with each method associated to see to get down to such hitle details as sharkless and hith hearings and draw links Brey time a car displays treater of any kind, a block for is placed on that con's record make the appending ate besting Purposely, the care are given emptioners here as that of no time does the chest disclose toled particular make of our in newskings by its collection The writer stadled this chart for waar length of titue, for here was to be faged a comise stary

strong and week reduce of the regular ran of our. I'm spite the fact that most publisher area by gree on made design to their routh legenments, the o or experienced in most team, improved the file of gite, recording to this chart have long since teached the point where it might well be left alone, and elber (Continued on poor 37)



Volcanoes—Or Cosmic Shell-Holes?

A Discussion of the Origin of the Craters on the Moon, and of Other Features of Her Surface By Daniel Moreau Barringer

TNG to the fact of my having been pittle WING so the first of any having lower principles (sping to be the discussers of the origin of the Mether Craise in Arisana and to be the Mether Craise in Arisana and to be able to prove that it was profused by the arguet of a large mass of autoretic low, very probability, as I love stated, in the term of a compact classer of lown measuring, up 2000est in the lange centers has been greatly incremed. I have not only observed the moon in its different places. ragh both large and small releasupes (24 Inches and close) but I have critically count-

hed with a reading glass several of the best photographs recoully taken by the 100-lack reflector at Month Wilson The photographs in W. H. Pickering's book "The Moon" (1963) here also been curefully stormized.

In this paper I propose to discuss briefly the passible origin of these restations craters, seen thirty they sup of which can be required on the face of the react which is remetted to as As is now assumed there are only two results origins. These craters are either minute embra- or they are due to the burnets of soire. igner susses of anitre. I shall first discuss the volumes theur, of orlida which is the one executily salest by advenuers and by many grale-I am of the unition that were few of the latter have given seach thought to the latter endown, needs ing without growther the uninten of

the satestance on to their salestic If per although noting of ourse. that physical and chemical lens are the same on the mean as on the earth. The weight of scientific coluearth 12er weight of scientific opti-ion, both stantig astrogueres and physicists, in that the men has zeroc had an attacepters, Jean says from the kinetic three; of gases, that eating to temperature conditions probably had not spiritly an game. It tays have lead about it. There-It would seem that the room her tever bud afted on laws or netroric nater, which is one the greater farious, of not the chief the greater factors, if you can can factor, either white exercised into stress or in residency factor of recket tomo even, la productor reli ratio photocrets of this earth water, he missales . It is not see reitable to me that the so-called water of ex-stallbacker if it evide in the rocks composing the super-brist cont of the area, as in this early, model by sub-free to profite solester phenogena even on a limited scale. Again, a state of the solester get rely shows them to be for iran

erses than the laner emires but

that no two of these are exactly alike. There are pre-eral titles of introstrial regions, but I know of home which are really like the typical latter creares in the on the record more the cylician comparison of the chief recordation of the content of the earth and those of physical aspects the mean will quickly courine strong of this fire. The great law fires, so trained of the craters of the moth, are in overcome souther in the long craters. Thereare it every one waiting in the lotar entires. Is not a single entire! mentall peak on the mentals jest in the new

which is shalter to Paji, Actns, Vern

and other vocasses on mas 1790, made by me scrause of laws from a creation were and the building up of this mountainty name higher and higher as it down down to sides. I know of no creater on the earth which has it its center a created shaped till during to those which are observed in a great named with the least of These restrict and rentral starped bills or protected in the lunar cruters will be discussed later, for are probably very significant and in therms proof of the import theory of origin. It is in to me that it there was the volumb netwity which is generally released to have taken place on the near heliur it because "framen," so to speak, by the cold of space, there

storald not have been at least some typical, very large and long larg flows from these great regot. Ye stured not one is to be found, secolied "anountrains" survey stand, not six is to be found. The severaled "seasonables" expresseding the circular "seas," which will be dis-cussed between, may possibly say-ped text force in once observes let-they are not at all suggestive of them-to me. They are not succeeding offi-tion to the seasonable of the real-state of glossific editions and real-state of the seasonable of the filter of the seasonable of the standard over extractions these or discussions. inquirt of some extratour mass or masses. Again there is no criterar of descree, great or small, from which lave has Bossed over the surrounding imar has thosed over the surrounding imar surface. The m-called title or inhar surface. The moduled riflis tractic in the nurface of the room a perbubly, as has been stappeded, fects of najid coeling and shritakin it is not necessary as order to exist them to coil in the auditainer of v cuale operation, as will be seen from what follows. Physical laws being the same on the most us on the certs, the reservable sheare on the team of the typical volcanic phageness of the earth is certainly very sig In brief, the near- one ender institute a critical comparison term the aliaged volcarie plans of the secon end the known wa phonomers of the earth the sace regime that the two are very



Mr Sarchann's contention is that will other, that the same may be said with in the content of

is, has made except things dear to me in our dis-seless of the abbies, which preciously were not clear. also with its acknowledge my independent to Pro-

The thought which I have given to the pro ing a manner of years past has convinced the that the religions, once it is fully appreciated, in all in favor evidence, since it is fully appreciated, in all in fluor of the frapert theory of ording of the linear enters as opposed to the velocitie theory of origin. As I shall point set letter, and as I have professing pointed ent (Further Notes on Motor Center, Arthuns—The Aust-easy of Notestal Relation of Philhodylpha, hoptonber. 1914), there exists a researchite intrincing between the ever Crater of Arlessa and the huair cruters, whether all or large. It is interesting in this connection to note that the Arteses ereter would be visible with difficulty, if at all, with a 24-lack

statementy, it it all, with a 2-range glace if it were on the insum. On the scale of one of the Mount Wilson photographs above returned to, on which would the insur return Caper-tines (55 miles in diameter) is shown sa Laving a Classeter of about onhalf fisch, the Artisons creater, which is over theoremeters of a sale in thatsieve, would be only about 1/16 of an inch in diseaser, possibly ion small as above on that photograph. The waster, therefore, is, or I here-pointed out in an earlier paper, that the Artisons creater is a servel use it is and not that it is as large as it is.

I propose first to discuss the typical leave craters and then the so-called "seas" or plains before enter-ing upon a more general discussion of the subject. Mater theresands of terrirol craters and the restricts of other cruters are simble on the face of the on which is presented to us, and of course, there is every reason to before that there are just so must on the other face of the moin upon which the busses upo has never looked. Mirrorrer, we note that there looked. Microsco, we note that there is a very great shallarity in nearly all of them. This is probundly significant. It is a general effect which is difficult of explanation on any other livery of origin than the import favory. It extent be never estadding to the thirty are so reconcluded. the the Arianta crater which we know to be an impact crater. So for as we can judge they bear exactly the same evidences of Impact, an pack so, in fact, that a obstructual taken from an airplane of the Ari-

The the photographs of the most larger crater Capersinus, as an ex-sergie. An interesting feature, com-

men to used of them, is the everysiprojection, prohybenspee or hill. vertishe assessable to more of the larger cratery, rising out of the fiver of the crater. I am informed that of the crace. I am Browned that this floer is usually for helow the original survexelling surface. It ap-preciate the crace of these single-lik-hills loing in or very near the rund sier of the craters one should roud infesse Worthington's book "A Study of Spi

An I printed out in one of my payers on the Arisons. crater I was bard put to it at first to exploit a some what similar pretuberance in that cracer until I noticed carefully an accountily large relating failtry into result and perfectly still proi of water. There was live a sarging entward of the impacted water, then a seng-

The second secon

on Gi bit stille with reflicies from or Ny with tre great farm, as will be discussed here. because they have been filled us by comin duel or maintiel threen out of neighboring pumper crobes; or because the import was or or more the edge of a great pixts or "sea." I shall attempt to explain this great justs of "ses." I shall altempt to explain the effect hereafter. Again the small holes or, as they have been called, "sector" which are observable in the very et of many of these paraller central control bills or not visite at all, in my opinion, but shaply repower, the affect of the settling floreign until ages of the rock fregments. Outraction in cooling may have resisted in producing this other. It must always be been in talled that there has never been any wind or rain to interfere with the street, downward pull of the ment to promite with the street of a great ride of make

to of which, us I think, the regard hills are

On the serie of this photograph the Athena series would be 1500 lead to Gassero, and would per-lacte by irrebible from the earth with a Solute less. More ceneral view of a car water portion of the muse's surface, showing several of craters, and one of the large "seas"

ed, ft is new to inegite werk an effect of great turive frees on these depressions or excition which we shorte in the tops of many of them. In a number of cases it would seem that the restrict till had follen down or smell after being fermed, an effect which is stily due to gravitative Serve The opt librium of the rock fragments forming such a contral bill could made be disturbed by the lawter which world result from a brightering inspert as well as he other crosss. 2. A farther study of the mostle surface leads on

to expelled that the excelled "way," all of which are eraphic election, can be required as evidence of each news additions of matter to the moun's news. The may have been usede when the moon's surface was it a more or less plantic confittion, it having been resident M; L c., less tierre, by foots. The united here legan; i. c., the recent, of account or restrict, in term common companed of both neithed output and resting projectio, would relatedly spread outcomely, as I filink, in a more or less circular counter, that is this from the point of impact. It may be ever probable that great names of extralugar to

tertal bruke through a ecospatialisely this "frough creed late liquid material lenerals, or provided in tribel of removary percented the well for street and heated ruck between to become them; causing visings outburse of the Sould has like material which would feer entwards and more or less reduits inco the point of hugari and over the hand surrequisity surface of the same obliterating or Hitze older content in the path. The cried of the most when cold and third own that a great part of the energy was ted concerned beto heat het was exerted in producing the effects of crashing, painerising and expanding the land neck come ing the ernet, with the result that offerie were produced Arisms A relical study of the plotagraphs would be not be indicated that its property in the current way in the current beauty of the photagraphs would be not be indicated that its potential this is the current

> The fact that there are rela-Delega tionly few craters representing later luquets on their new solidifed sur farm would seem to indicate that this is true. These features of the month surface deserve closer study than I have been side to give to them, but in my opinion they after no estdences of what we recentles as the results of volunter artistry. On the burger pleasupousles one out my our talk peculiar law ridges on the surface the "was" which are strengly sug-positive of backling or writishing of the lava-like material upon recting. Winterer the origin of the various features of the tanar surface, I can features of the tanar surface, I can not escape the conclusion that they have laid a concess origin and that the eddence, regarded as confederals and linked together, in receivable

theory of the origin of the sees and

that not improbably they represent the effects of comparatively late cal

inch in face of their being due to import rather than to volcanion. All of this, I are informed, is hold by sense that meny of the orbs composing the solar system were loughly over in the form of ma which upon contracting became liquid be-fore breeduing wild. During their liquid state the planets and meets would, of course, by the action of gravitative force, assume a spherical form. Later on they probably re-ceived a vise mander of middions to their mass. Also the Impact cruta harpethesis in put in our year in con wasten of but to rather in support of the theory that our present actor enters represent the benefits up at tenting sport of a pre-valeting sys-tem, or possibly of a dead sun with out planets revolving about it, and that the neture out of which our spotts has been reconstructed was respond, to a certain and perhably to a very large extent, of mouses of solid matter, the fragments of the dis-

raptrol body or leader. I have been told that the order of our states; peed never have been really games or liquid to have awared practical sphericity if large except. This solid number thesing in space would gradenity gravitate together and form conspect clusters. as I needed, and three to turn would gravitate toward other larger chaters or mores until a planet or its mount because the result. It is not difficult to believe

that the heat current by the handrolouble force of one of these imparts, when the conditions were fixed able, would predize force and that liquidity or plantiefty would result. Also that finally the outer england would pirel to the cell of space and cool of to become first plastic and then solid. On this theory we are, of current observing the effects of the mary reveal inco-

It is not difficult to visualize these conditions or steps in the landing up of the next and psecubly row; other orb of our spaces, the sam libraried. When our has one visualised them it is not difficult for a studen of the taxon's surface (it can be storied by the endtery student better from photographs than through a belowage, although the latter profule some important features which are not remoded by the abstractable reality that Mary Justicians, Mary Harry and 1874 (Continued on poor 61)



Our Point of View

Our Bunleshun Flort Is Not Jank it insering patte has recently level born burded through the proce with a tusse of subdeferential state of the Patient States Nave cost parificatoriz alexat its legitimings, which name has left the traidic worky perpanent. Also, there has been utdely published a report to four Admiral uses the defects of the United States feet which were discound in the winter connectors demandituded statements were trade in a leavest win goe have been small surprised to find inherest spears. of se of "expert", the latter criticiscus are of course

to be taken in all performances. The orticles which place the Flaced States in the that matrice, in a rath, Great between five, Japan three, United States one, are so full of gross enuggers tions on in protect beautiful on the nitrie of all pends the have our pre-mable knowledge of notal const fans. They represent the latest surfered of an exagsted and relaterating propagation, stand to discredit he Westfaster Treets. The observation and matter of station the investigal facts in these articles, support hough of course they do not proto; that the source of give to be formal in that happily very small eligne of harval efficient who, from the first, have blinerly egored the naval treaty, and which, though debti from weiting over its own skepature. Are been sending ces disputelys, dated Wardington, all alming to show that the United Nation Navy and in "new deal" at the Washington Conference. The visit tooledly of our aired offers, we are larger to say, acquired in that Tresty, believing at to be a statementile formulati which yet a resp to relates competition and heregis about a feelest of under and regued understanding

ng the tipre good powers collected. The allocation of rapital ablies to such power was terrained by the healing moral others of each News It one to were broughly left, they wan officery breedy property of the tieneral fixant of the Naty, knew per fectir well what they were daing; and the public may wet mounted that they took very good care to protect the interests of our New and see to it that the elgisteen cepital ships winderd would fully equal three selected for Great Reliats and were in the proper proportion to these alknowl Japan. The orese orthire west to perinferior to those of titrut Bellate. Prevently, we be e that the executings, if there be ann. Her with us. Take the study fact that our classess shine will carry to the "Markland" and her two shorestween dear of the presental statements with a sure principles. feet, for wear years to care, will ted contain a situal one of these great weapons. Again, at the present willing on thee "Marthade" are only from two in these errigo" and "Yours Educateth" class, our from worth to play years old. Ago is one of the most important, if not the part inspectors element in determining the present day value of a sligh. The newest slight of the [1975a] Beet, therefore, our not call marker in gas power, but the skips then when one other, and therefore, much further on the total to electrostate. There is a great advertises held be one floor in the fact that our floor and the show embeds the bessers it execute that tought of the great Statile of Justices. The leading Statio Alpa, so the other hand, me per-futhers, and we deale premier that the history small applicable and more efficient them one built before that buttle We letter that our three pert-lations 30,0000 Marylands" with their statements game, their 18th a 18-leck arrays, and their live statist-marks trails, obwithin the other, in a fight with three 24,000 cm. "Regal

feveriges," (per-licited ships) would be inside state

he older treeds. This consistion is lowed upon a sorfal numberation of the various affective and do

readys structte which rater into the construction of

These press atticks emplicate the fact that we are

by "Maryland" and "Regal Neverrige."

wrocene thirteen medern bernirelties. It earn publing about the fact that, before we removabled to scrap 450 makes this, that is befor Poster had signed the Treet, tires British had wrapped eligibers medern but leables and seem hundred and fifty other ships of her great Novy, and that with the enception of the Treety So years for the extendeding fraction of the pass of rate

The criticisms of Admiral Course are of a diff theoretics. Thus, do not call to experies the Territor but they are in fact a wester arrelatment of our fallers uniting our Tresty Nery is few-class confiden The beliefs of our bulllandits must have been allowed sale tracing basis. They should be send for tweety a hart. Cognes sont be genrous in appropriation for teristensten. Netking depreciates at mpliffy ar a neg intel weekly. As to amonaged ables, by Nore what we have frequently stated in these exhauss, the ne should belief at some an existing of class to be first on orders to bring the order tempore to be the proper screegth. Also we should build a sufficient numher of thettis tenders and wearship enterprises. fittells, we believe that the courties of got elemlas less over-dressed. Bestly outrasped the Gerts retions by several thousand yants; also be had the seed gap, not be poser engaged at 20200 to 20200 rando productor to Salet at from 22,000 to 25,000 tuells Settle courtles at 25,000 useds in clear weather und winds reptiles pay must be species topot beonle: les the dans nion stelletter le extrete to n 15 (Missessed transports flow and flow harmone on the broad) many of the world's worn was

His Honor the Movor and the Engineers D' RX were solved to manue the most recover engineering work in America, we should be tempted to give that letter to the New York enters of wissers. Other engineering works may surpase it in certain particulars, but taken as a whole, the New York solven system is nericaled. It the else of its cars, the legath of its trains, their see the fast that it is the only elly solving provided with oute concess tracks, and above all because its fatalitice have love only one to so year prillion confed we do not hewither to place our subscept in the presi position as an example of the work of the American chill raginer. Neurobeloo, the distinguished Mayor of New York, weather of the latest night of the endteers for the extension of the salarge motion, rate " Treats Complete approach there treater a set of printed descriptions and many airboat any knowledge of three mode." Now any processorants from the Mapit of such a great city as New York on a subject of such haportative, wheald he haved taxes the facts and wheald be made with a full impaining of the circumstance. It should carry weight and menticine; promitting, it the Napor is to be believed, the impetant work of his the dress estimate has been done to a hardward war to a look of seen who know practically putting sheet

And admit on the facts, Companion Harton elle us that these pirds were prepared by the same engineeing staff that made the plans for all the subways going back to the first of them which were prenamed taxable rooms aux

If this staneoust of the Moree is not deliberate at resistion, it is an exhibition of grow ignored It is the latest and must designable exhibition of that arten of this great city which has marked the preobaltistration in its landing of rapid transit. Here other the vertice circums of New York home works their led and much be morally. They are reasoning the fruits of that project of civic dation, which leads people, on also this fay, to prefer the automobile to the voting booth. Lowering the Level of the Gross Lokes part our was condition the one can

abily, muci sympathine with Chicago in the serious dileners, in which it thats itself with regard to the cisposal of its sewage, which hitherto has been discharged into Lube Michigan. Now although this is a large body of fresh water, Chirage also a very large city, and the steely discharge of its drainings, year after year, direct tate the lake was bound to become a nationates and arreas the protests of that part of the population which decile more tip tale The question of defied nutres and water-fronts way out of the difficity has been sengit by re-

ending the Chicago sites; diverting its waters through a camel into the Mississippi value and carrying of the city's drubuge by this channel. At the present rice this canni drawn water from the later at the rate of about 4000-cable feet per second; and Obleago is not serking permission to increase the flow to MUNG-raidfirst over second: thereby persons that of the whole of its drainings and also tridening the channel so as to give an outlet for lake shipping to the Mississippi and the thaif of Mexico. The scheme, so far as the City of Chicage is concerned, in well planned, and so far as the present weak to increase traffic with the Mindeshall it has secured the exposet of the cities and States that beeder on that great waterway.

But there is a fir in the eletrosts. For if that reach rater is draited out of the lake it will reduce the lablevel and thereby bring alout none very writes ever plications which, it is claimed, will seriously affect the navigation of the lakes and reduce the efficiency and canadity of the various loke ports. Not only the Ameri can ports and American obliquing interests have cate a protest, but the Outselfan provertowest is also oppresto the connectanted work. It is distand that the rever vertices comple and looks such as those at the Nauli Re-Marie and the Welland Canel, to say nething of various ports whose harbor closses have a limited depth. sing the St. Laurence River.

Chicago replies that such levering of the lakes as as occurred has been due to florteatists of the rain fell, and that the increased flow through the Oblings canal will love to personent effect to lowering into levels. Here is a hig problem which most be faced and whose solution will gall for very coreful planting. are inclined to think that Objects will find its less

solution in the adaption of use of the modern methods Long-Dissance Locomotive Runs

of severe traditionion.

MEBRICANS are posed of their steam relimed entires, and that have every reason to be Its present perfection is due to the feet that Its present persecuts in the owner of its development lass been in the hunde of trained and able tecinics) sees, who have been left free to plun and beiff without any governmental or other examine interference with their medition) work. Always our orgineers are stainty to cut costs by getting the very maniferam of performance set of their readined and noting stock. The levest entolesce of this is seen in the measurem to increase the length of isomotive runs, by parting approache crows at the same become ties, and thereby carring down the time which the loc-meting spands in the regard-house. As no example of motive specia in the remediature. As an example of this, we have the record run of a special data of loc-matine designed for bandulatance service on the quitter of the Students Pradic Railmand Company. This explice is descring twins of from twelve to featurest care as a contineous run from Lee Amples, Chiffengia, to III Pape in Transa; a distance of fill miles. The explic-tation of the description of the miles. The explicais all burning, and its tender carrier 12,000 pallons of mater, and 4000 pallons of all. The average work of this isomeories is 12,000 miles per month.

Here and There



nemanaturity mount status Rat more of them, at least upof letter statistic than we reside. The Tes Act, for its etrere, under widek all team entering the United States are subjected to rigid tests, delenback to 1865 All abtrematic of top, under this Act, most as to a headed expression niere sateples are taken of then it soundates with a careful matitie which insures

entictive. These samples go to a board of tru Connector on a heathern house teders working under the limartment of Asricalture and are checked by this board against fixed stoodands of parity and quality. One would perform not picture the job of ten tretting and tou tueting on our calling for the labors of seven expects working full time, yet such is the case. As eridence of tide, we display between the finteres of one-would of the board of texton, Mr. George E. Mitchell, Naper-loing Ten Expert of the Farmes of Chemistry. In the origiinst. Mr. Mitrhell was surrounded by a large queent of the atmosphere of his profession, but in the prohad to "crop" gil the etmosphere energy one conful.

tigatio research worker and inventor to the A D'indefinitiatio research worker and inventor to Dr. Lie Delvered, whose name to extragramme for regin arrayes. It was Deforest who worked out the undo least of physics radio in this continy. It was before who introduced the third element or moralini "grid" in the variant take and made it the a-solected eletries detice wideh it is today. It was thebese who took the three-bound tule and harmoned it in so notice

different ways not only for the betterment of radio, ket for the marked admissroom of wartelestative. It was Delivery who spent sear after year on the position of railtelepiote when that problem seemed inattractable. It was fedlered who can ried on radio beneficiality when the oth-Recover were the startled radio constears where care were trained to the dist-dash inageage of the Continental code. And it is this same DeFened who and control to peri on his well-earned learning in new engaged in developing the talking section picture. Speaking alway hunrels, Dr. De-Forest on more than one occusion has hera descived of the credit due him for

his work. In an art so complicated as radio it is quite natural that others should her claim to credit for certain developments which were originally weeked out he De DeFerrer. A case in point in the "feed-back" or "repearative" arrangement for the vaccure tobe, which has keep twen the subject of considerable Higation. For years DeForest was deprived of his rights to that invention. But a er court decision reverses all previous mort find

lage still awards the priority to this invention to Lee De-

M of the case respective it was a scappard lear then the delly weather prediction ere bed grosses, and that the man in the street cruit tably "cupper" they be

WE are want to regard pure this stay. It's different today, for while we all under-Seed here an experience of such that weather is a flight; third and is not to be floweset on any banks of 100 per cent occurry, we per arrend confidence in the contents of the little has on the unser right earlier of the fruit map of our severalise paper, and mery largely regulars our conduct according to what it recorders us in the way of rain and shife. No But- ends for this incomment is annually in day to Charles F. Marcin, Chief of the Enthel Nume Weather Street, whose periods we give. Not alone to Mr. Narria regraelije for mon hunovenetis in the metine of the Bureau that make for better accuracy and better acreirs, but he is equally an inventor of parts in his closen Self. His mornwests for measurinc and amountfully recording related, exceled, estships and approphetic pressure have gone far to year

> MORE and more the reports of popular phoposition which reach us from Burne, and the findings that position of the type that descapts an expression of result from negatic impedication, report short two branes. Both these names have specied in these missay in consection vità Xe. Ried's European adventure, and upe of them has likewise been even arrange the list of our contribution. Professor Charles Michel, restricts head of the depertured of abreleight at the Dalversity of Paris, and Dr. Opstere Geles of the Institute Metapophique International, are the perferred to where we refer; and to

mint the reference, we stone their obvic-

graphs. Mr. Nicel tells us that li-th one modilet Beneat of their crutials WK shall lear more of these connections before we hour lea of them. At this movest, the meliumistic profession-whether product) or fraudaketh he rald not venture a guess from this illetance—in beam ing on the Continent, and our most above workly of a

per neftm. Nor it is little, described es shelding from his prosen a landpreserve which hafter Errical and Grie-New It is Good, with the production of extraordinary infellence physicanae Now it is a Speciard who hole up with the ability to see through notal begon and catalog their centers. But wherever It is, they active Path-lan Investigators um broadable died office to behalf of the granifestess of the performer, or an

A N Instance of the latter set in front in the Southerd with the X-co. ever He came to this country with a great father of politicity. What one did not learn until one went to sit with him was that he housely his own beam-two of them-and would give his denoustraight other with one of these. What one part learned if one were a best observer, was that one reald see the resistes of the Netwerk bosons (see an well as the

Fener craid, if see but fully is-citied and full-fully followed the Negar's provedure. It meaks well for our judgment in selecting the members of our own, our mirror for Papelic Investigation, that the only persons, so far as we know, who have seen through the perfemales of this front two overees on first serving It, are Dry. Chrysteries and Prince. We call the Source ly the shorter and uplier passe, became that is what his twistigue marks him for. He bears testimodalewhether gauge we do not know-to the effect that be has "impressed" Geley and Richet; and he presents tis performance as proximely papetie. He is a long pring on a picely when rais step removed from the comparatively innecest type of was provided, and carrying arrist who does his stuff without oftenning any opwith applicat the an-other chiese, and primits the audience to explain it as at a galact the an-other chiese, and primits the audience to explain it as at at an impensible they will—even Brookel is account, by acres spiritual-

lets, of point possible possible

THAT'S a bordy interved that term "luprowed, which we leave mad had new; and at the risk of renedity out our game we are need to expect a lift area it We have no dealer whatever were "Improved" by the perfemales of the X-mo-resi Chartiflets, and sold so

they presumitly didn't say breaver, was that they were improved with his granizely psychic powers We are guity of the same hotle artifice for gaining a pullibras calt from the prosence of the franchism cont.

us, particularly if he less a postiferously pumping the coining from every neether of his stell. ences, "A very interesting performance"; "extraordinary"; "well worth while coming to see"-these are but a few of numer ogs expressions which may with litera truth be applied to any performance of usy type, provided only it be well excctied. And it is very arrosing how this versally the clear freed will bigger! full

notice to this little play on words, leaving our presence quite confident of his ese insertance and with full belief that he has browed uses us. OT the hast of the whealth natemplays of the For it the obtains are netted for treating commun celfs, which has just new overs to gramal streation through its me by President and Sire Coulder, and its adaption in the New York City health authorities. This proces is a in-andort of privation warfur and expertuentation, and physicists having discorred hetarly by norident in the first instance, that the breads ing of all committee small assemble of cideble see cleared to some colds randly. The species of the applicability to all colds is still eyen, and it is obvious

ent, alter the most entitiery intelligence would detect the results of exercises before they could become written The irrelatest over its present advanced states to the years of experiment with munkers. The offenge to cur- takeralosis has as yet but hern encreeful L AST ments we streamed, in "Here and There," some of the invariant activities of your lines Ramond After the Public Health Service, from which we then three our examples, the housen doubties thinks dret of the Bureau of Antenal and Plant Industry in the search for further proventional character of striking character for our out go such further addid then this without

that an eversion will aggrapate rather than relieve the

spreptions. This is not a disadvantage in practice, how

We present, for instance, at the extreme end of this more the pretrait of J. Harding. efficial construsion to the Federal Georgiana Ten didn't know your l'hele Sannet had an official ready the presupports inhoran drauged bis concertions CHEROTERIST THE OUT BASE He works for the Depart ment of Agriculture, striving for perfective in the week fertier of pare, wholester confer and almosts his of forte have meant much to the infeatry.

entransitive the nearly Cities



With the "Limited"

Some Startling Facts and Figures Regarding Our Fastest and Farthest-Traveled Trains By Charles W. Stokes

a certain point in the run, to reach 110 miles an hour, and even suberies trains can be frend to puss 70. Whether or not American milrosis multitain for their fastous favor the high speed of, my, for pears If from not write their set down nine prilar as a fermile by stelling to the fundamental of writes the inche go by-

for rose up to 250 miles, 52.4 migst, for 7 270 and 500 miles, 32.3 migst, for rose betw 1000, 31.5 migst, for rose between 3000 and and 202.2 for roses over 2000 miles.

Experienced of second one treation to the Experience of the first treation of the first to the "Literature" the best thing is to ch ti-er her, ruther, as we perfer to their working theretakes would reveal the curre: It is very few ds she is nurtu s of steel, force, ada de energy, her fire-ley, her steck beliebsension, whateled the over the jurd solicies with their winking red d green eignals. And e teams, the may op of ours, this, disti-d for the sight, with people neiers or many destates riting tenunds fring & in there—at the

quantly: the import yoù is to run it se and to keep it uniture fishe the press of tre running it the same the opposite direct it is a stepandon not a mileral mice having become cut without that the rivalry of competing courses or the growth of he

pone could ros a train sintly: the hoportess

laters or naintee from the running time of his rearing pets, or in the services of it can be down, of occure; but the actedities of an en-tire system may have to the changed. Navebe classed. Sees the factors that p less at junction per

g and probable the out our still lit, with m sexulty, electing eating modulatesand we can go hans to bed

Inside, of crape, it may be different. Speed, Themy other things, is componently, depending upon atter you are on the expelle of the inside. The ed tony be hitting up security of Aty sales as been but not your highly miles up hour; but some passet-pre will be sage to be passing become-they are not pritting there quicken. The passenger, it is certain, sees things from a honory from. His tendency is to the a happy focus. Ills tendency is to the histopy on a distant older, which takes much begar to pass his line of violent flam would the train live! creating thereasy by the violen operator at a distance of a down or two fort. Hinter the Linchte, with its excess face, its

as any precises then at the feather's d. Its before to out onc's hair or its stemographer to write one's mail man ide it. The really fine truips of North Assec , and could find things of North Assec-ion are conflict, in a few companies, and the conflict, in a few companies, and to a few "rizes." The beared rule are a few 'trans'. The bearst rule at-fined, perhaps naturally, to the west-half of the continent, chiefly between trans and California. Residen these, are are there or four legaled other m, but quite so fast, which have ed a correin assessment of factor on as pepaletty, and which have rered the dignity of laving name of E as the mere nambers which the

perfine core, its palary measurement its

ha its valet to prove one's paste and

niting department bestern upon a. A great many New Yestern, for angle, would fall to recognize in the paragin, would fall to recognize in the 126 P. M to Chicago, or in "Number (" the great train which has become baset an institution in the "Vestions". The fisting trains of this regiment, ofing regaling itself from start to the gen the rivel Person businessed from Philadelphia Athenile City expression of average S 4 miles un hone. Sono

bear train between New York and Chicago, core at an average apped of 45.4 miles per hear Tex the Limited in sufe for the Great Way and the treewilty for find enumeration, learn to boil.

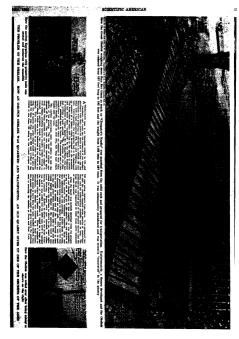
I say in differed: Speed No. Speed Step in Speed on the competitive "inside" were strained for say in different. The Treemirch whether the hour of arrival or departure at terminal is consmiss; to the fraveling public, how it compares with these of a competitor, what evolutions is ovail Courses theired for execute to now a Wilese reals Refuse the war it was an 16-boar train. As a matter

SURFERENCES ---SECTION AND PERSONS 100 For Eastern.

with these of a competitive, what equipment is ownly-nible, passing trains on a single track system, and so in. On oversight runs between fairly close cities the logar of arrival is not cless clink the boar of arrival is not comenty as important as the lound of de-parties. High speed, in fact, is intra-table to the common of the common of the con-trol of the common of the common of the com-traction of the common of the common of the com-traction of the common of the common of the com-sense point at 1100 P. M. the latter will get most of the boate-on. For it per-centage of the common of the common of the com-cent of the common of the common of the com-cent of the common of the common of the com-cent of the common of the common of the com-cent of the common of the common of the com-tract of the common of the common of the com-cent of the common of the common of the com-traction of the common of the common of the com-traction of the common of the common of the com-traction of the common of the common of the com-traction of the common of the common of the common of the common of the com-traction of the common of the out having to leave before the final car tale. A new center to my attention re-mently, too, in which an important trenk cently, too, in which an important trenk line A, the substiliary of a higger con-pany E, which was feeding through trails to B and also to a friendly asso-ciate C, declined to deliver through realize some quickly to C and thus apped up the A-C am because so doing neight here the A-B hardway.

A-B busines. What are the furthest traveled to And the further trivial claims of the speak seek of tryanscellance; the speak seek of tryanscellance; trains in a study there is not one stade trial entire from their her seek or the west cent of the bland seek of the west cent of the bland seek of the seek of the west cent of the bland seek of the seek of the west cent of the bland seek of the seek of

mited "form" are detailed in to that which appears between the Theory owner, of course, of that, the preight dating appears and the second se



Our Abrams Investigation-X

Two More Blood Specimen Tests and a New Offer of Co-operation From the Electronists

By Austin C. Lesoprbourg

MAGNISIS, "the R. B. A. one not only interesting positively the existence of one dithers of mulicinery or infection such as a secularity, sufficient, sufficient, infection, supplied and respelts! spittle, reliepes, strep incorriently, etc., etc., list cars determine on in their very lacinflowery, and flurisensome camlocalize them definitely in any part of the bedy. perhaps used resulting of sill, the degree of their viru leavy can be neclerostically determined and, as inprovinced in bank, the degree of happenesses our Direte be present

"I fully resiste that this electronet; is of the to tremention significance and I have curriculty swighted even word of it. In diagnosis alone, the Abrana conoffers to the world by far the want severate and Thus writes Francis A. Care, D.O., M. is, in Prorough Manager for July, 1922 Dr. Carr in a practitioner and instructor in the Electronic Branthes of Alexans

not increase in the passenge or writes be does no with the full numberity of the electronists. Furthermeet, this statement, and many more like it, is bring handed out to the American public in the firm of risis from Person's entities and an order

had beenless and pur-phies. Surely the stulehere he nothing here to suggest upertainty. The rectalger is pripresent as a finished piece of work languiter past the experimental stage. We are prendered what assoupts to health the localities of huproduce which rearist the many branches of medern engineering. Hence this committee disconsistment over the by the past few months Whatever may be the wandeful accuracy claimed for R R A discrease in overyday tice, it is a phole

positive, is in a posse, and fact that this security capted by depositated before any look of inpurity, continued investigation.

Indeed, R. R. A. teripings then, the load function sed, R. R. A teristical then the lead theif to title methods of investigation, for the more scienthe becomes the broadgatest the preser and a You are told in K. R. A. Streature about the remark-Total are field in it. it. A. itterature about the return; able accuracy of E. E. A. diagnosis. You are cited one after case of diagnosis from seculied "billing" case after case of stagmosts from security season spectroms, in which the electronic diagnosticium had no contact with the potient other rises the blood spectrom. Yet when the electrocky disgratio was numbered with the findings on the operating table, the electronic diagtests was found to be dutilized neverage. And such cases see cited in great numbers for, if there is one thing which has believed the E. H. A. curse, it Is the child of settlements and often ton-constitut diag-

The E. R. A. Supports reference on a first the E. R. A. and other electronic workers norty relatings to eshed) their technique in our teels, had of late where of them have corporated with us in this work. At verhier rights we have endeavored to get electronists to examine blood visces from known clinical cases, in order to man pure their findings with the lateren facts; but such tests to not been lasked them with firme to the cien Non the late for Albert Abrents bitmed sisterly refused to undertake such a test, became

or he winted the abstracts feelings (fid has not agree with the clinical facts. In which event, of we would be asked to accept the electronic findings as the true picture of the bleed depur's condition, while ignering the sintess symplems of the oser No no have lead to formulate stopple seem which would serve to check up E. R. A. Endings against these Thus we have prepared for various electronic tiriness a set of six bleed spectages of which three are of the more blood, and the three others from three different bloods. In each test the dispressions has been sold that there specialises are of the same

iked, and the three others are of different bloods. which is more than fally The first writes of blood tests was described in ou Talk series was undertaken by so E. H. A. dispredictate working with profes E. R. A. tern have spent over a year inswelgating coal stodying and marketing the electronic technique, and have prepanel a well-known report on their findings which, to their, no highly foremable to the E. R. A. renne. This orient in being extraordintly used by the E. R. A. mark as an endowement of their work. Nevertheless, on

right lima, hearter at top." On the other hand, the floriday of continer electronic show to V. N. for floriday of continer electronic show to V. N. for the floriday of the continer electronic floriday on their late floriday of the same floriday on their late. Specimes of house, and the specimes of house, and the specimes of house, and the specimes of the same specimes of the specimes of the specimes of the specimes of the specimes of house, and the specimes of the specim 107. In or 107. C. so har as the diagnosis and treatment are concerned.
The results of the second of the two tests above mentioned, using a different let of specimens, grouped Specimens S, D and S opportune, whereas our records showed 1, 2 and 5 to be of identical bloods. Thus our

second Seathern collaborator has second a total failure trails for the same speciarits, are just as all original as in eather the sames speciarits, are just as all original as in eater hastanes. In his letter of transmission be states: The simplies were not projected by black paper as they should have been and there may have been contaminative. The really should not to it that these samples are wrapped to black paper, and that there I no writing per type

is from all parts of the world attending the E. E. A. course given by the late. Dr. Albert Abranes in his San Francisco close room.

timed diagnociries have either been led mercy in their warsh for something new to soil to their own tectation, or that they are knowingly and investigably faintlying their electronic experiment poperis. We, personally, perfec to accept the focuser alternative. Policeting circle on the bests of the first sector of Fitting over the new test to the love score to blood specimen beet, we have made two other similar tests, she with a very well-knewn E. E. A. may wish that, she with he have emblering an adjectment eithir with the responsible of skilled electronic profittioners, and the other with a regular Aleman period. tition view zene is often nettioned in K. R. A circles as a skilled hand and enthreity in this work But there collected as an electric to the form.

The results from the first two of the two marrianes. above fadicale that has identical spectrops and an lookered specimen were grouped together. On the books of marketunical probabilities, this is title better that pare cluster, and the accurate grouping of two identical specialets is established offset by Including a third builted specialet. Furthermore, when the "obranges" for the various specialens are compared with those

found by another electronic who worked with these found by another electronics who wented with the same electronic inter is a disreptory between the elega-rice facilities which is arbitat short of sizeing. Thus the Northern positivent's findings for Provincia 4, 5 and and 6 share the following: "Senation for required and congenital applicits, 2. It through both beau, the right being facilities. Secondar meeting excited through velope with the blood scrapie. If you should want me to test further for you, I much prefe that the samples be pro-All of which is per seated here for what it may be weeth. metheratical certains of the Abrams rather of Captures of which we have been not read so much, is not always preserved, so it severs to

when that excited is under rigid test. And by the sweet token at treestigance often shoel ders over the prolifemorgine electronic di-antonio, in view of his trike with E. R. A. nas ander test.

what suget be considered the assumence test of E. R. A. technique, at fair as this investigation is emberged. For the past

and the use surveyceton is recoverage, but the par-month or more our constitute has been working with a doctor who winnis well toward the top of E. R. & Indired, when this doctor came before as said offered Indeed, when this decire came before us and offered in undergo or seeks and all us in Indiag the classic reservant, he made it perfectly plain that his work for an wealth have to stand or fall on the own bev. He solded us he was a leading E. R. A. exposent; his reclassified was the shame-pere Alexans branch, with the latest of versaments included; the appearatus to be resployed was voluments lecisded; the appearation to be employed was our own abstractionated fifther with Look & Northeap providion appearates which we provided at his require, and he was to be given ample three and proper facilities so that he would have no expanse to offer for ultimate fullars. If shalters it about the Contractation, our policy of swedding the mission of any name it (b) procy or avoiding the intention of any names in investigation prompts as form giving this doc-name, her all names and findings back of those re-presented named by smoth, are included in our co-fafter all, for the broadest purpose of this traveling we are interested in the technique rather than in dividual presentationers.

dividual possificaces, In all, there have been six formal assistant with this decision. The first issues required over two broats, the decision. The first issues required over two broats, the Mr. 38nd of our staff, the occurrence of the reactions. The subject or reagent in this case was the doctor's river. But of the variations in the action of the road, to be some that the case was the doctor's road, to be some that the was obtained to connect these control of the connect than the connect these



Left: One of the divers who went into the suff ments of an electric are. Creater. Manusch atmospheric generator which had to be assemble. Signed: The states, or non-receiving part of the generator, with a man standing security mentals; job.

A Still Larger Power Plant THE massive walls of the world's largest steam-circ-tric percentag station, owned by the Brooklyn Sci-

Three views in the new

At the presenting within, weard in the Denoises plant of Longuage are margined. This plant is beined as Richard Name at the East Town is Breatly. The Month of Longuage are made as the Longuage are made as the Longuage are made as the windows which now determines in dies. The term proof paid is the windows which now determines in dies. The term proof paid is the windows collection of the windows which now determines in dies. Moless and term 6,000 kilomets principamentes. She was all their 6,000 kilomets principamentes. She was all their 6,000 kilomets principamentes in the seal and their 6,000 kilomets principamentes. She was all their 6,000 kilomets principamentes. She was all their 6,000 kilomets principamentes in the seal and their first paid at 1,000 kilometes principamentes assembled. In the benevate delta suscept collection of the principal paid and principal paid and paid and

evoluting parage of 50,000 gallons per minute ca-city. Each of the condensors contains 51 miles of blag through which the cooling water will be forced the gazet circulating pumps.

by the gast develoting yangs.

The time the groups visits will be used to free-water too the bolizes have been set in place. Two of these will be ideal enfoncting, but hind setting as a space in case of oxidates to due of the other rest, the excrypting out the general design of the entire state, which generals for at least one abstractor for every thought the process of the groups of the pro-tocol or the process of the groups outside the properties operation in order to large contracting of portage sportings in coper to major contrasting or when. In the boller mean, the eight large bollers we least assembled. The accountie stokers in here e cost under these believe are completed. The sixed sings, lined with freshrick inside, in which the great will reterme six tone of coal per farmers ex-

will reteasine att into of one per farment every on-these to are flathed. The stand flams, which will outcoy the games and onle to the stacks, after those have given up most of the heat to the belier takes, are built and in them to been placed large case-from chalco-cution; built did will be 1500 with women, so that as the games over them, the cinders will drop out and be find n the busin say firme

The two glats stort starks are new supjeted, plending the skyline to a height 1500 feet from the greated, which dwarfs being even slong that part of the beat where high stocks and high are accepted in that of a lead-the area to equal to that of a lead-workness have built a Heling of

£ 10 ft of you used to restore the of the water would not proper grang while the con-une were thousand, and a dam with an electrical their applied a hool to be orbite and of the wire-ter in a hearty power as dry, so the collec-sent date the coll so the optains. I

at electric correct was set up through the wire plate, an electric current was set up through the wire in the enfections, and the book in the bands of the workness—or direct. Then, when he delt the "pull of the flowing current" of electricity acting on the sleed pling, he would withdraw the test a militant distance,

to form an ane, and in this way, by recentedly foresigns on electric are, the pling was out has the beam of the miner was roll. See above the basement, the hope are \$30 feet alone the street. They are constrained of rings, such ring consisting of four sections, the top of such ring being streeted to the lo-settime. The top of such ring being streeted to the lo-

entrant, the top or man ring strong traced to the in side of the one above it. Each stock has in it above 240 time of stack.

Evertise of the two stacks was carried on from pint Account of the two ments was carried as 1900 pair. PRIMA the platfilms being at the vestele, and was superaded by two wheels which not along the top of the ring fresh which it was bruz. The other platform cuffermed to the Indio disserter of the stack and was sespended by right blocks framered to the inp of the ring. At the center of this photocus was a must said

and of sufficient beight to allow a section to be placed on the ring above that from which the platform was When these sertions were set, the outside platferin

was priord up and placed on three and the fearth sec-tion part in place. At the same them the dust blacks were moved up, one by one to the are vinc, and when all had been placed in the zero position, the make placed on the placed on opposition that from balls, the placed on the placed on opposition the from balls, the placed on the placed on the place of the placed of the placed of the placed of the placed of the breakt to the new Boldon, America Position, one of the largest highlighted electric provider parts in the world. The generalise, which has just here arbitred has personal to all of the placed of the placed of the placed of the placed on the placed of the p these furto-precitive expuble of familiaing allow, suf-ticient light for a city of 160/60 population.

The logs structure, which weight more than 20,000 states, was newthin of the United Kietric Light & Power Conpany. On Setur

okiya Edisat Osupuny's wherf at Hudson Aven All Hallows developed years; a linguage Arrest All Hallows device Station a great craste upoin resized the meeting from the large and placed it upon the pine. After being placed on the pier, the work of welling the generaler thin position in the power station leaper. When it is completely intuited, and the steam divining unit is congressed, the accessive will represent on investment running up into the leastre number of deligers

The electric processor unit alone is 16 feet long of If feet high. No militud our was hig or eithing rawagh to bring a mass of such swight from East Pittalergh Pa., to New York or even from New York to Brooklyn. It was, therefore, decided to assemble the associate at the Hell Gote Station where, it was said, or were as good for the work as at the East Pr

where is good yet one work as it the false a moneyape institutioning plant.

Eight seen worked day and night for five mearles planting the 120,000 pieces of steel, such 14,7000 of an lash dales, thus postigs. The altered innumerable parts when changed together down practically a solid mean.

They from the magnetic structure of the states and are of special allog steel.

One of the chief problems to a practice of this type One of the chief problems he a machine of this type in to every waves the surphs hear from the chief that the limitation will not deteriorate in use. The machine is the surph of the chief that the chief existing to the surphine, a between stretchests force cold-tration that the chief that the surphine is the rate of 2000 croids free a minute. In 24 hours, this assessment to have these 1500-5600 persons or this.

The shall of the precessor warm as an ex-curries a revolving field weighing 120 long, or nearly as an order shall inself. The field to The shaft of the presenter which is 28 feet long

much as the status or enter shall has!. The field re-lates 1200 three per minute. The field is six feet in distactor and therefore, the speed of the field at the warfare in frue traies per autaute Aurity the materials med in the assembly of the activates are out into, out steel, fregod steel, rolled

and drawn excest, sheet mics or integran then tare and number. Mos insule is used to withstand the high tes tures within the machine which must not exceed 200 degrees Palarenhell. The strengest available flat car in the Pennsylvania Relieved system was selected to carry the rotor

A Study in Electrical Contrasts

part will develop 4500 herseporary, and the available

part will develop 4000 herespoter, and the assess-well revolve of Closes per mixer. The day verifies The day verifies the power into his her has been as was revound by the secrete department for our law and it shows in the works hespital. The director of the large verifies in 15 feet is inches; of the other, the large verifies in 15 feet is inches; of the other, the large verifies in 15 feet is inches; of the other, and the control of t



adjusted to the Findman Avenue Station. It was relied out on the dook at the first of East 104th Street, Man-batton, and then prepared for the recording of the journey down the river. The following Transley, have dericks and gamen sound the 104th mass title only











VACATION is here; it is the time for us to forget the workeday world and its worries; it see a sweet sense of relief and contentment. To the city man there comes a time when the great town wearies. Visions of green fields, farselling bills, tall trace and swift streams. Free life is the open calls, and if we are reasonably prepared with unio, came, test and company nest, we are removably sure of a good The red and gan will supplement the supes which have been brought along. Broadly waking, there are six varieties of comping-zet the permanent camp, then we have came, sek horse, transping, forest firsting, and auto-obile camping. All of them are enjoyable.









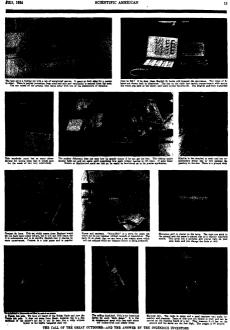








THE CALL OF THE CREAT OUTDOORS-AND THE ANSWER BY THE INCENTIOUS INVENTORS



Repairing the "Shenandoah"

Replacing the Nose Cap and Rebuilding the Stabilizing Fin Restore the Naval Dirigible

the very series, durage dide to the bet specify may very in the year all have level made good, and she will be site more in service. A recent that to the Lakaterre Naval Houser has enabled as to pather additional data regarding the behavior of the slop during the extraordinary wind which went over the first. and to give the fairly unselesses spinion of her officers

the carrier year of the will and the partial streking of her structure. It is now established, largely on the testerety of one of the ship's offices who was near the stern of the "Newholesh." was and the said of the "repairment, that the treple legal with the tearing home of the covering fabric along the sales of the upper stabilizing fit. The edge of the opper stabilising fit. The four fits are hope effects and for income

than the layers would imagine when he goes see of those great ships in the als: the fire are dwarfed by comparis with the wast both of the wood truth The arrested fix was about twenty five feet and its purpose in roomen with the by the sertical and locimetral readers stal previding sufficient norm to emphise the skip and proved its "reditor," or reting about his kegitedhal sale That the covering fabric, if it gave were

anywhere, wheeld have began to hear above the leading edge of the fin, was not ital; he it has frequently happe that in high-good firing places, the of the conserved to year at the lend the edge, perdirelectr when a whole or saired executes speed when diving to upo or affark an editing. eaps or arrant as county. When the cutives was rissed at the

front of the fix, the blast of wind entered and, exacting great pressure, hiere must of the fahrle away from the frene, of the same time portfall wreeking the metal frame work. As even as this buy the upper fig. the great wind prowers on the over the legan to your a powerful terming recovered the "Nietzahirah" about its long tedies to recent the "restations." Here we want the side was received away from the mast, a-

in the frame of the wide at the relat where he me is such fast to the asset for raw. the expendence being arregressed to provided with hell bourings which theresterily, straid here allow this relation of the with to take place It is believed, honever, that element did not fearthe properly and be In a larger function street on the mose of the ship, which gave way on we explained for the staff or factorisery, that the combithen of the weedage showed colours of "is pull sted a tele" of the sourcest of the fivester, it should be noted but here. that not for from the specific most in a morgical station where the oversi the side away readed a relegity of sea

extyrus siles per loss.
Presention of another dispers of the kind is being awagin in the streeties of what the pressure exceeds that, due to a wind of a cretain maximum schools ago facty to forty-five addes per hour the of

it is fast an logical for the "Sheramabah" to be siln her rings in a gair as it is for a visit of the sea to do en in heavy weather and make for the apenen in leave weather and many the the upon, many, are, of centre, the heef Judges of this, but we are well of the opinion that it would be the part of neadeper so to strengthen the few of the skin that, if the extensive release falled to function, or when the slip war expect to a motion gast of great visioner, there would will be audience structural enough at the low to carry the obly through the configurey without fage.; tents the laws, which we enquested to our April beam would be different to intentil state the user of the the left and not, to we provided, within it. We be-liev, innevent, that the suggestion is worth further conditionies by the Contraction Come.

This shows the new of "Shrezzadeak," with the metal nose cap, we cut of the ship, riveted back in place netal tree has less relatit in plant its er

with the election ends of the lengtratinal has be reinferred; and operal attention has been paid to the re-fredge of the relational bearings. In requiring the broken stabilizing fin, an addit content of light stays has been bell in place both mediculy with the saits A frames. This was done to provide a note consists expect for the constag falcic cent the violent flugging which, in part, is be

HROUGHOUT the nevel and military history of the Unit States there has been evident a lock of continuity of policy, with the result that we have always been in a state of chronic space We have alternated between furious and enturagent activity at the threat of danger and incremelte neglect when the crisis had passed. In the Person product person the nation is in danger of falling back into the usual attitude of complicated indifference; and nowhere is the danger more opportent than in the faile of named and military necessaries. Example, in the nections of the loay, and properly as; but me must be metalitie egizent complex our reduction too far. There are cortain legacies of the ber which should be carefully maintained. Compication among these is the few ar action, with its superb hanger for drigibles, at Labeland. This the few or station, with its appear bendary for displains, at Ladystant. This is the largest takings of its bein of elistens, and is the "Stamstades" to present the only simplific the found ampather in ordine commission. In a few mode, the "Stamsmandas" will be spired by "PEA", a larger and faster white, such objects of the mode, the "Stamsmandas" will be spired by "PEA", a larger and faster white, such depicts of the "Stamsmandas" will be inpresented in the art of displain constitution. The \$3.300,0000 loops, with it to true for strike, and the spicious farting field with to steel marriage must, constitute on misses present, constitute on the spirely.

lieved to have been responsible for its being tern loos has the trases. Outside the fractures to the frace work at the l distrible the functions in the figure work at the low-and stem, there were no other nettices injuries to the skip. The project halos which appeared under her hall were reased by divergiar masts of greatine and other weights in order to being the skip as when she digged and the long stripe from. There have have been presented, and the long stripe of exten taken two frees, her her the long stripe of exten taken two frees her her be-

developed .-- THE EDITOR

the pilet our, has been taken out and the spec-to a more powerful radio ouths and accoun-"Of the pilet car, has been taken out and the agen-nised to a spece powerfur ratio owith any accor-ditions. The weight thus saved will be just list-class, and the cruising ratios of the slop well-rish be carriedly increased. There will be a recruis or of most when the slop is specied folioset; but the states on which matterns possible speci will be associated for will be very five; and it is col-misted for will be very five; and it is col-

stated that the increase in cruising that at forty knots is a more value military asset than the few knots at me

military seed that he few knots at made must speed resolving from the use of six as against few motion. It is needless to may that the presument, offseen and mee allies, are estimated to write virtues of the helium gas with which the "Bistandon's is infants, and sixty the "Bistandon's is proving mil-tary ship that multivalum in well placed, by which their multivalum is well placed. try whip their subsulants is well placed. Speaking from a military standpoint, there is no question that the possession by the United States on the only naminals nor of stay magnitude in the whole world, places us in a very strong position in nevel and military warrang position in nevel and military warrang. Helium is an intering as, that is to my it run neither he act in fire and explicied. The "Shenardonh" ray never he wiped out of externey with the sud-Courses that marked the less of the "B-86" "I towards," or "Rouss," No one, of course riches that the "Nemandon's le terrete from fire. Any alternati, whether bearing

than air or ligher than air, that is drived by guardian engines is exposed to grave few risk, and the "Enmandous" levent is not exempt; the few officers child that any five that started would be comparatively small at the entage and with re-sinces would be detected and extings before it surend. No great is the military adventus conferred to our possession of the only extrasive as

ural source of belias, that it is considered by som of our secondarial officers that belias should be prenonneed a military need and restricted, so far as the United States is converted, strictly to noval and util-tary now. They claim that the sources of supply and they clotte that the secrets of supply and to of the gas should be placed excludingly in the helids of the Government, and that his exportation to foreign countries about the probletted. We think that the point is

well needs, perticularly as the high cost of helico readers is per for passenger or freight similar service. to concurrial companies either in the Datied States or stread. Its value is of a strictly military character, and the fo elen meren mucid program our res tive as an obstrue and perfectly just pe

cution.

At present, with hadroom conting a few dollars per thousand and betten from all to 50 feditors, overseroist already compaties are restricted of mentality to the chesper gas. The lift per 1900 colds feel chesper gas. the state of the s

of 10,000 prouds. With guesties at the day graphics of All possets per galles, and a consecution of All possets per garden bear, this would mean an increased reduct a mine, at cruising speed of of mine per house, them is now riseased through the extraction of the games, by refrigerable, through the use of air. The freeign passe have a ligher temperature of invariant mean than hadron, and as this lapsets.



ny the retreating compound from the rather with a guarding tards. Left neuters Planking the tim in most, in preparation for finding. Right neuters interfered constructs. Right Cross merics of a tim, showing the neutrant when Nech makes was found with the willie left on the tim, and demonstrating the se Details of the process for retreading tires so that they stay rete

Is Tire Retreading a Faffure? MILLIONS of tires are annually thrown away

while the excesses are almost as pixel as new. there were a basis for field in the common regionals torflard of retreating, this would not be the rase. In attempting to jet a pleas of new rabber is the eld rabber of the worn ties, there is trouble. It will be tick. Therefor, it is constrainty in acts the worn ties right down to the cord or failed cultures. work the right count to the over it many comments through your proof to the old result the breaker and the cashlon. The extreme is then result read with a ring so that the new rather will make it head with the tity threads that are than expendtotal will the titly threads that are title exposed.
This bank, is a unifier of fart, is withen similar shough
to last bear. A way to join rather to rabber—now not
ber to old—so that they will not only silek nominer. but so that they actually fine together just an two

i genore. Hit is province have now made the appearance. practically everage most of the methods used by the fire valencines and spinistens simpler mass in their plans. The meant stone, calculating in a very critical plane. Who meant shows rule-staining is no very critical operation—one traveling shows a critical in its order to see that the exact degree of heat and distantive heat is second. The best is affected by sension of cleans stoice bands strying with the compensator desired, a present of 20 peachs or square laber corresponding in approxi-mately 300 degrees Fathershell. The sour process of persons with a steam and case day heat, such as that

These against leaves.

In ermedifice, a time by click process a sum share be a remedifice, at time by click process, a sum share of decrease failure. It is were than tendent is attempt to be supported by the processor of the sum of the control of the sum of the control of the er to per.

reliber to new. This comparatity holds the sature in su-peration without actually removing in from its position. As vegloration placks contains up to 25 per contain-sature (which, by the way, is not an estimated to subject (which, by the way, is not an estimated to it subscribes) according to the analysis of males that in to be part to practical used, this actuals to the dissection for reliber becomes a wife, tooky press, climbs to the

relation. Sect, a strip of raw or moment relater known by the rends as a "consideral" is cut to the exact Postfal sociation for the consumpty in externio the time construction and in consumpty in externio the time construction of a rends of the rends in story in position small the hiere conflict related to story in position small the hiere conflict reviews pain faced in early less position and the hiere conflict reviews paint and it ext that the text. The pile is now ready to be placed in a spreader-stand for the purpose of operation of the long, make-the sortion. This is much us a fifter that the conflict related in the paint of the first place explosion of the characterial presents. es tork. To be placed by a moid, its upper helf is o

theritated screen. The dry sand decritates this persuare tends over the whole inter-scripes of the tire. The tire, or tires as the one may be, is pland in a streamen relief and the tree may be, is pland in a streamen relief for the last the stream conheartify used in the valenthing proves, is applied to it for a duration of two hours. Here is our of the great advantages of the powers. In valenthing with stage leaved of with dry hou it is very difficult to keep the pressure, and therefore the least, at a uniform

degrees. The charge that takes place when the head is replied in interesting. The companied that is used for tem-posarily desdificing the largest of indirect on the set-face of the eld time, is expensed. At the same state, the end of the eld time, is expensed. At the same state, they become one. If form sport for two is no more ap-ing failor the Eas of dessurantion between the old and two relater than electrical. But not if no more allow each place and the eld and the eld time of the eld that the eld tha wase of the other, and on realing the two will be one in the case of the three, the sid and new rubber, re In the clost of the three, the out and her better, re-garding of the architet of different color, become ste-The folion is, according to the known of the process, pressured. The chief admixture of this new process. of the retroding then, are that it utilizes the old rabber of the treal instead of remeding it, it is much study that comes taleschier dispeder with

were sufferly; and it can be perfected more

Nachine for Elling and seeling takes of paste or

In place, and pressure is exerted to the signified radially from the incide for means of a number of execuand he has skilled lakes. At the time the process which has fast been described may withrest, two new hands. both allies, were ledg broken in. Although these men had been at week but our day they had already pleked up except faultistity with the simple proce to need no apperrishes. splicity. Lordy is makes a joint that really holds.

National Trade Mark Law in Chira A SATIONAL trule much registration law has been A emercia in thins, providing of which make it accessing to register all timbs units utility to regulation to assimate the rights of the peoptriess. Property rights in a trule mark in cities are new

determined by the date of registration and not by the date when the trade nurk was first used in that even ry; although in some coses, it may be prooffer to elaim an earlier three of artestry by filing solgence of commlate and continue regionalists. The term of registra-tion is nasury years and may be reasoned.

that is navery years and read on receiver to On the filter of an application the papers will be published for a period of six namelys during which the appointments in below. An opened application will be decided by these examiners from when decision an speed may be taken to the minister of agriculture and opposed may be haven to the intelleter of agriculture also comparers and from the mittelet's decided an agree may be laken to the Chinese courts. Insertach or citizens of the United States will have territorial rights in Chite, a citizen of the United States will probably be extitled to have a convenietly seat with the three examiters is deciding the case and the same will prob-ply be true at a learning of an appeal before the mingay be true at a neuring of an appeal return to the bear of agriculture and contenter and before the courts. While it is not absolutely necessary to use the trade mark in China lefter the trade mark is registered in that country, it is necessary to use the trade tearls tible one year of the registration and this use true not be discontinued for two years. On the intringenent of a registered trade sorts

infringer may be required to pay a fine for re-residing fine handred deliters, or, he may be imprisced for a period not excreding one year. The goods or which the infringing trade nurk has been used may be read-Chill provisions of the law second the laboral party to Chill provision to the time person the thicker pend of a take the infringing goods abled have been selved at a realization to be determined by the every with a pendhilly of a deficient judgment

Packing Paste in Tubes

IT IS shaple enough to squeete the shaping crear
and the touth more out of their tubes in the more ing; but did you over stop to wonder how they get it the take, original. If the fremark heats just to space from the falcies, the attence will be found in the numeroul pleture. The empty takes are placed in sectors and run on an endown hand. They first puon nucley the marks of the tal contribute the selection with widely they are to be filled. This appears, in the picture, to mediately in front of the operator, descending from above, After the tubes are filled from this, they pare further slong the marklar to be revelatively soled As the tubes pres on ground, and assume a position is utilish they would be likely to fall out of their budgets they come in replact with a bread proteil legal, eve of the left of the apparatus, which boths them it out it they seath the mouth of the chape. Then the band territates, and the dat-fed takes pass out lether, ready for marking



Airplane camera without cover, showing the Sim apods which handle a roll fire 75 feet long. The camera is operated automatically to take pictures at any produtermined time

IEE alrylate is alway to get to new job. If wereas to be the traclesceded assistant there was look tooking for to help nates even collected spitchly and never nately.

Does the wear proportionals Employment Interest direction that he met fractive, the factorist identification that he has been the baseling, formet-less that he may are then appear, the contraction of the

If such a strip were been the lengthesis and these construct in any particular Strip, there is no garden but that it would give a fall than of even arrange and reproduction that have been filled, particular State Bat, particular State Bat, particular State the production of the strip particular State to the strength This is one of the day points, while the Popularities of Arthristicans.

epitions of local reporters had to be depended upon

Given at the photoacteph when an the pure. Yet will seeke that the he read with the he will be the read to be readed to be the photoacteph with the hill seeke the photoacteph were eliterated to were all times the photoacteph were eliterated to were all times the largest to were all times the read that there he is used to weak the photoacter. It was to be the photoacter of the the photoacter of the photoac

inches in the telet is inch

Typical crop-reporting photograph taken at an abitude of \$860 find. Not suffyest fields to accumulate determined, but the universe of the orange seas to determine characteristic apparatus.

Crop Reporting by Airplane

More Accurate and More Timely Crop Statistics by Means of the Aerial Camera and the Planimeter

By O. M. Kile

most is notice and instrumbles. It is not becoming the latest the water is which the place in Gazan, to need the platformer is better of some of some of the control of the

use of the designation and of the plannings represents authly for acres to experience the law being represented to the second of the second of the second design represents in Administration between the second design representations to the the Earth Status Hoperstated of Agriculture, where he has second cloud of aments of load from an all belief over rather strongers and with neutralistic most least over their strongers and with neutralist more result to the same that has been delay the experimental version in the second been delicated to the same than has been delicated to the second to the second

the state of the s

wreap ratio capation of leafs invegered, with presicrating its breas of text areas placing.

"The except to which such a record could be used on the country of the count

under here wilder fleer vom in te stade is the stare with the greatest and greate

, same eigentent. The max this part see attribut as son might think at first. A given every in frazzl to possess effect, by which the representation to see effect, by which the requested eye on result) of a second experimental experiments of the second experiments of the second experiments of the second experiments of the second experiments of these controls of another results in some next distinct controls of another results in the second experiments. In second experiments of the second experiments of the second experiments of the second experiments of the second experiments.

requ. in some parts the content, perturbative and assume southern States, the date and shape of States are assumed harmed by a stational companied freatists. In the states of the content asking highways, for instance, will show ratios agreeting very riverly with the ratios at content arrange, then to the fact that they not to assess out its size. The companied

of zeros would be the store acceptate of the two social ads: the computation of rution hased on numbers of fields would be the more

expeditions. The chief umbless prescated to the crop extreat ing at a would estimate of nerous early in the wa Department of Agriculture has but to depend on many thousands of reporters scattered floorghost the country. Naturally, such man is influenced more or less by conditions on his over forms. He brown more plant his own over their In does about crops in the met of the township, and in some instances his estimates may be far from setten to make an actua us of arreages quickly out to be of any yes during the current sensor And here is winner the sirplane, with the quick accurate check-up, gives the heat opportunity to make remperimes with

m. N.V. recognises on the street early the previous year. This comparison may show a 5 constant may show a 5 per cent prince or pessibly a face practice by the norm or critical spream. By

remarkably close estimates out be useds. turnity the higher the elecation of which the flip to seads, the wider the strip of territory include: the photograph. But this advantage is juined at the disadvantage of faintness in detail. Experimental week curried on by the United States Stareks of Standards has, however, developed a method of belianting out these faint boundary lines so as to be much more civiling. These experiments were started late in the revest war and the methods have store been greatly (superved.

Does reporting by skipdane in its infrary, of course, but there seems in he wavey resent to expect important developments in this science. The expectingmental work door to dain has had to be corried out whatever appearatus was arediable. Airpintes and concess leaved to the War Deprimer have been It is probable that improved apparatus can be sed for taking the photographs, and improved methods weeked out for identifying the different count

noting their condition as indicative of postable pieds, and it measuring areas. The first practical use of this system will probably be so a clock on the figures ascared by the prosent methods One of the points to which the Office of the West setes to new forming its attention to that of the degreeof securacy with which it is possible to dependen ent crops as neocoled by the camera. When foliag 00 feet the cappets used corres an area of 467

at 1000 feet the carrets used cores an area of 4675 feet by 5625 feet, practically a square sale. Those who have spent a little time in studying the phono-ters are the studying the phono-

graphs fled it easy to point out which of the fields were platted to cotton, own and have lost it is very mark oder to do this five photographs taken at 4000 feet elevation where the capters covers un area of last 2200 feet by \$210 feet. In the obstaventies the notice cloud Os a characteristi different from that of

rounded shape which is

There are still come

interio be determined or earling how this arrise crop-reporting plus would

work in other parts of the continy where the field

crops an mostly small

grains. Possibly the pir-

taken at a lower elevation

Then, there is the question

of how rapidly the picture

can be interpreted to be of practical value. At Tailin-

ne enother thespected spiration of the administration of the administration in

HIS Septial in a rece Totaler bed an excellent article dealing with the liter ringbook irrigation where

(N. R. W.) and closing with the remark that Asstralian before Assertives as much as they night be, literar is is a pleasure to give a fire rulers of the great star tric private new being pushed alread in Victoria Opposed, the realists part of this workerspart state persons place unlimb leven mail resistance, the

ne Department's official tech revaling three areas each of thirty square unlive with great thicknesses of real and very little overlanders. One have put down real and very little overlesson. One bere put down 1610 feet at Mormali muscled Dill feet oblighteen of boren cost, but as a percent rule the scenar are not blocker than 150 to 180 feet and here an corelarate of 25 to 30 feet. The fact that a lifeted were made "miliated" can be need. Of the three Gloredard arous

Belliaviland type plane ready to take the air for a crop server flight. To actial camera takes the nictares through an executor in the familiary for

1804 this had group to 50,000 horsepower and size that date maid increase has taken place. The rie tricity commission has definitely in rotal the expelying of all important towns between Reisradale (12) takes of Melleurne) and Warraumbod (MS talles were of Melberral Although the expensions had this it view at the time, the sides council of Galor, a town of Sent people, 16 miles west of Melboarne, completed in September, HCl. on electric power station of their sets.

which did ped errier sadi it was unfertunately de stroped by fire. November 24, 2022. Then the con-24, ECZ. Then the con-mission "got bear" and in-street of the council recreeting a \$9000 station and lawfor it discounted

> Mornett athene was fital-ised, the latter body undertook to over post-baste a The from Gericky, 50 roller dietarit, and get a tempe rary supply from azother -repretantive to that city. The neversely authority was abteined, a suspir oblatted of enough

exceded poles for the femile lize, with all property winter and evaluates: the like used a kerr power ash-station and tracedoruse ets lies reveted and the server finally extirhed on to Cobb on April 13th, 140 days after the fire. The actual construction work of the Marille lige took place in afest built this time and is shought to be a world's record. The line will be later used to supply the section district with record from Motorell. The power In latter to be coole available to each scattered forms and termidies in the elelely of the direct lines. whole of Medwarne's substinit rathers and-an extendingreenty self-out in one-cases and handled from the central station referred to in the Scottista Assessorat

ed for the purpose on e of on orn on survey more and tens of least coal; gother 0-til a little farler on

the one at Normal (business to Mellegrae and pand

suffic marked) is estimated to make 5000 million

pleages were taken one day, developed and ing 400 miller new with several smaller fields before the state's listed up to 11,000 politica tree, that is 2000

printed during the sight and were ready the next day for study. The question of cost is letty studied by Mr. Gogs and his sourcions. The source to these series married and further the next few crop seconds providing Congress ma audiable the wherealthal for the work. It was be come the common thing before long for the Depart of Agriculture to keep a flork of similates to send forth from time to time over carefully proleterative renter and bring both phongraphic ordinace of the second

into of invest end accessible for every man, women and child in the state. With over realization of the are the time soon with kee highling of the time to which there fields night to just, the state pre-critent in 1935 passed as "Electricity Connelmoners." Art, unforteding a necession to Inquire Into and report on all electrical applicabilities then existen sector corporation moving them, precede the part of electricity for my and all purposes, investigate possible manes of electrical energy

> in peteral, to occupe any ut have general estated over ele trical enterorier throughout The executation has already sepred its artistries over a great part of the state. In the of Melburne) it has taken over and is morting over and is working our moure sale of real results. extracted to rectall enough leven coal to sutisfy Yin totals requirements for 150 pears to come. This is being worked at ones cuts and a great power station with an faltist expectly of 50,000 kilo-patts counted. Pursue is to be mention of a voltage of 600) shing a Weally libr of 15-deal steel tearry to Spale

word, a suburb of Malbourne which is to be the chief die tribuling reason.
In 1900, Victorian factories used electrical energy to the

were stretche back in new electrically operated and terror in later to be absoluted from the correspondent Fighting Senility

PARSICHENTS reveally node by Dr. Senerid, at the General Hospital, of Prague, and by Professor V. L. Mindeposite, at Mariethad, Carche-Herald, with a regular entered informer Estamblishing. collisial effectes, have brough; set a recordable allectating effect on the allectate of old uge. While White Drowns has long been preclarly regarded as a good ressely against arteriorierous, Prefeser Miséries sky's experiments show lived personer to be reduced by the artica of alliques Cherical and physiological lests made at a Marienhad chemical interactors fittedly resulted in the production of an extract containing all extractive exequatests and which, already after a few days' use, has found to being d

suffering from seteriose's remission that this product contains to learning in profirms

According to a personal report from Producer Made person, the effects of the first treatment are sufpriette, many desperate over lording best recei or greatly relieved. Aspice portons, estima and other rious symptoms offer will theappear already after a respir of days. Apart from these resurrishing phones sen, the substance tend by Producer Mindriventy on many interesting cherical rearthme



Interesting Details of the Work of the Archaeologist as Disclosed in the Carter-Mace Book Just Published



edagy there is nothing uses the first the stery of her this great find was calles were dugged for useks with the results of the resultsible find. Continued credit must always be given both to Mr. Contro and Leed Committee: Land Cartarries record out his money freely for years in the scening find, when the season permitted, Mr. Carter worked plany and carried on the discoveries as far

the hope of at least finding a great treasure. After as he could, when an understand contracting arter with the Egyptian groups ent quilatities which we came to live. We trust, bowerse, that matters will

Furnishin deposits are a case in point. In every con-struction the arrangement of the deposits followed a regular system, and, having found one. It is a simple reader system, and, having found one. It is a simple mainlet to pay they make you be observed. As ex-value, these, mans see every object in position, great scale carried tools before it in mone, fact, if never many, ment apply preservable treatment on the spot, Orthoroly, made these conditions it is all important for you is keep in clear tread with your error scales." After describing the possibility years and observed. Clear, the surface takes in the belocomery which were at the start have fall in the belocomery which were at the start have fall in the late of the start of the start of the clear of the OL. They continue: "The tech was in the tends of Stell. I. They continue: "This tend was for good asserts, or that only the tend to pressible used for purcials work, the home datuse part being seen to be the seen of the seen of the seen was because in the wave deposited, will be to the stretchen, it the stable section, and record up until tree should be watched. Each in term was because to service the seen of the seen of the section of the service should be watched. But in the was because to service the lade have downed off, insurrounters of the service service of the service price surrheavings about a service of the service to the service of the service of the service service service of the service of the service service service of the service service service of the service s

eventive treatment followed, after which it was taken just outside the entraine for scale photographs to be under. Finally, haring powed through all these stages, the edget was stored away in the inner-ment revenue of the tresh to await the final packing.

time pecking.
"In the majority of cases to attempt at final investment was made," states the book, "It was manifestly impossible, for menths, probably years, of reconstructive work are necessary if full use in to be made of the natorial. All we could do here was to apply preliminary treatment, sufficient in any event to enable the rio-ject to support a fourney in unbely. First restrictions must be made in the moment, and they will need a for more fully no try will need a ter made flid pulped inheratory and a reach harper inff of skilled beloem than we could for hope to actions in The Valley."

"As the scann newpord, and the lab

oratory grew sacre and more crowded, it endugly difficult to keep track of the work, and it was call by ches attention to detail, and stricreace to a very defaite order of procedure, the we managed to keep clear of complications. As each (Continued us page 70)



wherey, vice-president of the embeddesor's guild repairing the pall fabric. This is typical of the palastaking restoration work

an, of New York, is the happy publisher The volume in operation to the first autheritative account of the Earl of Custons-way's france discussey in The Valler of the Kings. A biographical account of Ankh-Amen and his queen, a history of The Valley of the Kings, a fail resect of the discercy of the tent, and finally, the opening of the tent, and finally, the opening of the seniod door, followed he sa servent of the transcess that has belded it-there Mr. Curter describes in term, interest-building words. For six full seasons Mr. Corter had excurated unimann after worst "drawn a North. We had almost route up our minds that we were beauty, and were perpering to leave the Valley; and then hardh had we set but to the prosted in our lost de spaining offset (November 4, 1922), that we made a discovery for ranseling our

The Benk of Tut-Ankh-Avers," and De-

apting of the abrine. Mr. Carter and his of lowering the roof of the abrine

country for a series of lectures, fidences

cells a few works after the paties arises of

tie book which he wrote in culiaboration with another possibles.

Mr. A. C. Mare. The thirds. archandiglet,

of Mr. Hyward Curter In this

wildest dresse," writes Mr. Curter in his modest way. liefter going into near detailed mounts of the find. It tolers he will be correct more employees underlowe enteg Mr. Currer. He is assuite rated as of Assertest, but us a matter of fact he told the slitp news experter that this year his first orin to America at Thebes, for the late Threster: M. Dunts of Buston. which probably accentre for the storts of the forth on our above. Naturalit, he was saled about the sup-posed come of the Phenodre. He said that Tay-Azido-Amen had freelied on the inside of his coffe his Let all was love life and late death with the sands

of over sed bread and herr to up well." As to the supervilling that Lent Community death was a year-haunt for those bag the accorded work of digging up a regal book, We Center sold "I havebeen finding the regal trade-of ancient Egypt thirty-four Mr. Christ sected to be still post, but iny: middle and in county to pressure life thelifter labora when ate permits and the Egyptum methorities pe-We give the following status of the work, so the book was revocably written a few reachs care Carter mid: "As the even new stands in the temb. pored the retor cells of a wel-

which the King is buned reflag to maket recepts, we shall find him wrapped in almost of leastern gold. He is placed counsel In gold, you relight on:
"I am against disturbing the drait introversally, and If it were not for this rewards note, or sheet know nothing about suclent Egypt and its westerful chilling-

on. "I will do sil in my power to see that the King will never be moved from his touch. If we can examine by X-rays without unreling him, it will be deer. I all ner made a th videoest the primary bet for the royal hoties new resting in the Calm Mosecus,

he adjusted as that Mr. Corner can spend the third sense: in coupleding the nock which was beggs so epictrise; The first chapters of the look deal with each related matters or "The King and the Queen"; "The Valley and the Tornh"; "The Valley in Modern Times" They

Stiller chapters on the professor work, the forting of the took, the prefinitery investigation, and then the artest rivering of the attentioner and the opining of The treet interesting chapter to us is perhaps that drawfed in "Work in the Labourium," which gives reli-shed ride lights on the rigner of the work of the groups The outborn my: "This chapter is dedic

to them and they are augy who think that an enexhibitated by watching other people work for its full of beautiful antication beneald up from the ba of the earth from time to thru for him to held at. nd life to very different, and, as there ean be but he who know the details of h, h will be worth our while to give a present outline here before going land the question of the inherancy work of the peat incidentally, it will help to explain who this careful

"In the first place, it seem he clearly understood the there is never any question of having leasestfule of objects inneght to the remember for him to look at: the first and most important rais in reprovating in that the archaestatic must remove every antiquity from the ground with his one bunds. So much depends own it. Quite sport from the descripe of possible directs that neight be examed by classey stagers, it is very executal that you see the object in airs, to got my retained that you can from the position in which it Ten, and the relationship is house to phiests near the "The other matter before we pass on. By nothing the most position of an object, or giving of objects, you



ica is the orec of by the

large treek farmers. For charp and effective watering of a large area, there is perhaps nothing to equal this; but a French inventor is now on the market with a was a remod memory is now on too market with a necessital different could fer use on relatively small fields. This consists of a genying machine constitu-on an averbead truck, as liketrated. It will be ob-served, in our left-hand view, that the understructure of the sprayer extends out, perpet of the track; and, of everse, this dicalerly to the lite extension to william

any particular limit new that imposed by the carry-ing capacity of the bridge itself. Specific information is not ours on a sufficient age to permit a detailed but we gather from the which the sprayer rate is in the form of a fune; and that the water is dolivered to this frame from the standplps at the end. (see the right-hand view) and taken up for spraying by the machine as it masses

The advantages of havi ot all points, the fell have of the full flame, are doubt-

less responsible for this feature of the design. No statement is made regard ing the metice power of the appropriate said: the obs-

Here you have two

solient facts - for much traffic on a pair of one-free

ribbens and sizzed note on the rost of the pavement.

ur, then, build perts the same? Why not halld the parts which craf-fic uses only for passing.

c, power sai un

oper thereis sered for

building the two tracks or

is just what the Department of State Books and Highways of the Contam-

ghways of the Contram-aith of Econocky has no dobg at Pinerdik in ag Strae. The 'Eneldkie sick Highway," designed of patented by S. B. sere, consists, first, of a longipulinal 25-inch

ite trucks, concentral

ne is to carry the

of created state

4 wire des parts of stage to one part of it and rolled before g; and family, a one-

shed read, where

tographer is approvally under the impression that the affective "nationarile" covers all the ground there

The Railroad Track Highway

THE State of Kentucky has been representing with T a new type of pavenent for highways. It was recognized that whereas our macadian reads, concrete

needs and other kinds of meds are of starticular the

name outsite and the same of the same of the same terms of the same terms. Solicer a "rat" - it finds a path on hart of the

reed and sticks to it, versys when passing or turning

curp feel and firthe predigiously.

Irrigating a field by spraying from an overhead travels

Caro in Sewage Purifica

NTERESTING experiments are being made at var

a the pages in horsey to priving it carp is easier carded everge with results that show exercises you elicities in the resultation of feed material and near

our points in Burepe on greating of curp in Allate

e reduction of explanationies in water everyon

One of these experimental installations is lessied of

Waster, teer Streeturg, where a pend of about seven

acres is utilized as a feeding ground for earp. The eventy from the city is first roughly filtered to precomseperated matter, fermented in the usual way in septimately, and after seriffer out the studen (which is used by formers as a profiler) the enuge water is time with about one-half or ins-thirds of its volume of th about obsence or two-curves or he resource to the water and must through the curp pend before cle-cipling into the river. The disce senage, being rich In secretic matter, marrieds an alconduct growth of regulation, which is turn apport great awares constructe (atom) employments; and on these the

The water leaves the

tion are being shaped to take advantage of this engy. The Electricky idea affords a mestic of dring that in well worth extensive experiment. The Victory Over Rust R DST has been fought for many so to be precisized. The day is not for discert when

bridge will need to printing to preserve them, where weful, when wire and wire products will always event bright and skining with an airpost everlecting enter sper and when many hopededs and other neets and artivies will need no polishing or burnishing to recove s. terrieb.

The average reader will exquest at more that status enset to referred to be this is not true. Stabiles

strei has been on the rare ket for a massion of years but is limited in its uses-became it is difficult musticiste and frem into various shapes. Its princi for cuthers, for surgical is attracements until a few wards products as that. It has ph no menne teached a quantity production be-capes of its limited use. It is now difficult to bendle reculres careful treatmen but when faished is she

to the average user. over rust is a compare

fively new one. It "stabless" into. Because it is quite shaller to stabless steel it has been confused to some extent in the popular mind with this product, but it is essentially difin certain perilenters and can hardly be compared. Beproved beyond a first that runtiess from our le made in all kinds of shapes and forms in which ordinary steel today is new made. This applies to attractural shapes

from which bridges are made, to sheets and plates, is wire and to many other small products in the hardware Rustless leet, as contrasted with stateless seed when properly reads, can easily be rolled tato the foregoing products whereast liriefy, stainless into is a low carbox steel which con-

tains the serial chromoun to the extent of about 12 to 14 per cent. Chemically, its only difference from inless steel is the low cerbon ecution.

Rustiess Iron is on of taking a very high pol-ish which, under no cir-cumstances, whether at-mospheric or liquid, can be raned or tarnished. An supprediction of this fact is sufficient for one to realize the many westerful applirathers that such a terial can be rest to. If inrespected in bridges in the prophished condition three would need no point its to preserve them. If feters and sindler prod

urts would last many, many were. If mode into shows they would easily displace the splynotist or risc coated shorts of today and enduce muzy times longer It is romible that in the prilided condition this sheets could be used which would eliterately replace they are for country purpose.

Already some of these things have been accomplished on a small sende. In England various forms of land-

Water, each as books, electric futer fraction for reference

and other material, framework for grates and name

other similar products have been made and are in me

In this country plane are being developed to people nucles into on a large scale in the form of from which the roofs and sides of passenger and eiter

cars can be made which will practically last for years. Other applications of this "symber alog" are only water ing for the newbort to be works on a large scale

- Left: Constructors the lambde

The new highway new being developed in Kentacky

within: not finally, a one-doctored to compacted with every separation of the rate within seek and the rail.

The constraint probability and consoling of the super-turbal over the resultant parts. The constraint probes rained to the rained to the susception of the constraint probability of the rained to the confex on a pass of some billion of the susception of the constraint of the rained south of the rained and of the rained south of the rained south of the last throat all it is a successful to will be used to the constraint of the rained south of the last throat all it is a successful to the last south of the last throat all it is a successful to the last south of the south of the rained south of the south of the rained south of the rained south of the rained south of the south of the rained south of the rained south of the rained south of the south of the rained south of the rained south of the rained south of the south of the rained south of the

of 1202, and if it is successful it will be used to be have eld went manufact readed can be subvarged rel a good base etill estato. I various litates will be french large utilisages ef schem its land elegan. Of nor further value as read han, this is obviously mutilable as fromtaction for new methors, and read-building progresses in make

curp peed much reduced to milable metter and cleaner that under the usual methods of disposal. From the data obseited it is evaponed that the every 1000 tobablishes the curp pand should have us seen of The acres and that for the present possibilities of the city of Seasberg a total of about 175 acres would selfer.
Fera cellected from nacions places where this source

to a course proc technic pages when the system in the largest of fish per ware for exceeding the invests of fish find that regal be produced on at equal sees of the hers and much benefit facilities from lend, and experiments designed to show the maximum limit of fish production in these punds have not been

More Heat From the Pound of Coal

Adapting the Carbureter and Bunsen Burner Principles of Air Control to the Furnace

By Walter S. Timesis Fact President American Sensor of Housing and Vertilation England



to adult sir both under and over the bed, in the proper quantities at both on, and to differ properly the site itted over the fire bed. el-dgs savely hosting plant opendors that opening the slide or wheel damper on the feet door of their besting plants serves to check the fire

In large plants where specifing condition carefully wanted, it has been morel that the admission of air amond fre through leaks in belief setting curses a m

crease in efficiency. tipe can revestably aware that flow proerel observations may have led much to do is retarding the dayning of an entightened mind on this vitally important subject of all established over the feet but having had the couch accorded on many charges archives in this field of combustion, It is of further interest to note what practical application of times traths has been made in pendering them and

able to the public.
To recent briefs a successor of the its striking traths which have been uneverted, the findings of the United States Survey of Mines may well be queted. First, in somer to the general belief regard ing the admission of air over the fact best the truth Is formal to be uplie contrary to this belief air necessity for remplote combantion of the fact, sup-

pied theorem the grate; the other half must be empired above the fact led" (Tech. paper 130, page 1.) Feed Door Slides Inadequate for the Proper Admission of the Air

"facinate mixipo of the conjectible matter with the air does not take place in most hand-fined furtures, and this lack is perhaps the chief came of stocks chimpeys. In the most centers furney design, where the spiritual sir is admitted through the couplings in the fire tours, no triving recurs except by the satural diffusion of the games. As the six and the contentitie gas carrying the particles of carbon in suspension told to flow in separate streets, residence takes play only where the two streets are in contact." (Tech, paper 50, page 55.1

repart of a thin feet led is not advocated to a nothed for securing the cornect properties of air over the fire-and the fidlers. ing operation demonstrates this to be a min-conception: "If the five is land, very little five expans present through the feet best, all though the latter may be only from inches With a thirtee that bed the chances of free copying griffing through the find are still less. Therefore, sir must be admitted more the find hed in quantities sufficient to here. the contextific greet. [first paper 80, page 50.] "The field led, then, note as a gas produrer and its object weeks to be to godfo the A bed but this a curet to contact a resistant of CD, should be too till to be practicable. [Tish paper 120, page 32.] "All rates of contraction show that seems have of the first had there to 20 year eest to 20 per cent of conference with to free copper to keep it, that is the free extent in all med up before the air market the top of the fire hed parameter has fast the sir in Moore through " (Tech paper 132, page

Haw Air Should Be Admitted

Then it will be neved that through approprimately 50 per cent of the total strengt of air used in the beller furnace should be admitted over the fire, the Bureau of Mines points out that it should not be ndthrough feel deer sides, turning leads, or through a fait fact bed and find it connect to below through it had not very ere one our a country of the thirt had bed, and they specifically paint out that "The ideal way to supply additional air over the feel bed is to introduce it as close to the feel led stel to as large a number of small afrecus as possible

A marker than it is already in marker names the six is introduced to the strikes of the find led, the more resolvables space is utilized for mixing air with the contrastible game and for burning the minutes." [Tech, paper 157, page 25.] Centralled Air Admission Not a New Principle

This necessity for secondary air minimum over the feel bed can restlip be understood, when devices in WE know of ... more effective evolution than a the

W.E. boox of ... new effective coolstower than a thorough industriating of what lasts placer in a threate during constraint of the faul. So we recommed the, Walter S. Treesis, Faul Primitianse, stantantse become of the total part of the trees of the stantant of the treesing and V re-later glove, based on they are so imply usen the experimental work of the Borrows of Mann, and prove at which interest is all call usen and particularly, in view of the high price of sood, to the bases lotted.—The Ectrons.

with, of which there are a great mater, are evenly Consider the exclusives—law for wealt the perfection of the automobile engine have advanced, were it pet for the fact that endoneting keet save and develspel a deliver instrument which adjusts to the most execute degree the stanest of air admitted to the gasvitte-the fuel. Another one in point is the Welsia mently, in which the six adjustment used be accurably tasks, or the samile will either "blow" or sends.



Furnace with device in door for admitting binded air, to finely-di-streams, for burning the masse given off by the fire had

This this necessity for accurate oir minima is the curiouser and in the Welshack manife is recognized. Now remember that all that he does when all is not intend under the grade in a helier furnace is to generate a raw in the customistic charter show. If all is receiving to been granified in the same of the conjugates:
If air is necessary to learn gan in the Weighted
maxife, it can readily be soon why gir is just as whall
becoming over the faul bed to burn the maximum at the

the condustion clausier in besting plants. It can resultly be appreciated that the quantity of air air in pring in he in direct properties to the sasous use generated, std, in turn, that the suscent of generated is going to be in direct properties to assessible of air derives through the feel bod.

In the Resting Plant
The gas is drawn off the first test existing Plant
taxes offered by drawing air through the finel
taxes offered by drawing air through the finel
intell intell, and in admitting air so this gas if
the intell interview to middlessed to restinguise, if
hainers in the maintainers and controlled air
activation and porfer consteading use to re-

Quoting again the Roman of Mix Quoting again the Parseus of Mines: "Ob-viously, related to an important factor in occatacities. Marrly as excess of air in the ference is not enough; the air most to sep-pited as mear to the france of the that had no positicable and be thoroughly mined with the constantible matrix, in order that the con-tention may be completed to a short time and a small combession space made effective." Detto 187, page 181.)

[Statetta 185, page 101.2]

A devoted artist can take place only when the energing substances are invested little contact to form a uniform mixture. If this is not done the velocity of uniform mixture. If this is not done the velocity of combustion will be listed to the rate of uniform, which leads to investigate construction. If the secondary air is added in compensatively large extension, the pure and air treat to results stratified, and do not from a uni-form mixture; but when the six is added in a large-mental of small screene, the surface of

approaching the relectly of contention is regid approaching the relectly of contention of a sufferm mixture. aced Air Flow Above and Below Fire Bed

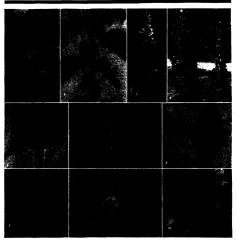
Relatived air admindent was above men-tioned as one of the reasoning features of any means developed for admitting this as resisttal secondary air supply over the fact led, and a destre law beat developed which cor-nectly applies this fractamental principle, along with the other essential foreigns of ad-soluting the air close to the surface of the fuel bed and in a large number of flor streams. The realisance of the flow of air through the apparatus timif is made to equal the reapparatus limit is made to equal the resis-tance offered by the fixed bod, thus preclaring to belonged condition above and below and through the fisch bod—o fundamental require-ment for correct and evolutional combination which is not offer ignored in regular further and baller design.
Our Illustration shows a gratery de

by Mr. Herbert Brussner for each individually different case, which provides means for any plying the necessary diffused and heated at splying the necessary diffused and heated air foreigned over the foot to requesty assigher, in the second stage, the constantion began in the bash had by distillation of gos. The device is of reactions within reference-the air is restaryised and in heated, on pussing through this structure, and in then discharged through a large number of small attention over the real had

final bed.

In a record test, a furnace was first operated with an open side in the feed door. This was then recovered and a door of the first shown in the illustration established. In the cases the dearly pressures record from 0 to 10 inches of water. The amount of air passing

beind or winds. The amount of all possible over the francise in certic feet per elitation was received for all trainers and all feet per elitation in the certification of the certification of the feet per elitation and the feet. All a denth preserves of 16 the figures were, re-spectively this cell of much freet and a desth preserves provided the cell of much freet and a desth preserves and the centralist freed. The cells feet per values, it and the centralist freed. The cells feet per values, it is as effect that the six of activated, centralist the effect of the cells of the cells of the cells preserves or to the ejectation of an bette preserved in the centralists.



T(S) may have printed, shown in two 'L', is will adjusted to prosp political, and more that was prefamily the prosp political, and more that was prefamily the prosp political that the same printed and the printed and t

In social case than by furnitur to your years.

A strong extend to filtered constant of its and the second of the

The live flower of the charge, Caleston shiples, and containing a live in process course in containing and in proceeds containing and in process course in containing and in process containing and in process course of the charge of the containing and in the charge. The left given to contain the charge of the c

Our Next Psychic

A Preliminary Account of the Case that Now Comes Before Us, as It Appears to the Naked Eye By J. Makolm Bird

is the wife of a professional man of progleme is the rity of their motion they hather Her hather was requested as psychic white to this life. After his death, curious mings began to happen; which were goodsally systematized until they had acquired the modually spatewoifted utill they had acquired the form of modissably by the sixter, unfor the centrel of the trother. Within the past your this mediannish has torted stought round objective planteness of great distinction. I have attended easily of the seasoes, and needed circumstantial reports of all that are hald. These appear but two attenuation; either the half in one of the strengest objective medians yet knees, or those reports must be dissulssed. Their context is such that they cannot be altogether honest error; if not accented, then require dissulsed as actual fibrication,

to which event certain of my own observations must the beexploited every.

The favorable rescal factors of the case it is impossible to exaggence; I consider them stronger than

in may contemperary instance of physical mediumship. The partie is so much a lady of refinement and rel feature gives one who brown he is lively seem of ted tests. It follows that the medianable is whelly the medicinally is visity private, and-professional, and free from the olor of noney. Indeed, entertain-ment of the silters is dete-

on a scale that makes it is large from of expense. I have been one of a recon-rent marty of place, and for weeks at a time there are greats at every distort. Nor um I the only either who is not un for the hight. Dislocation of the funtly life by all this is none, and the psychic's rele as mother of her twolve-reproid em to keen realization and con-cern. The medianship and its attendant philosophy, of

in the mental life of the household; but these are not is the instruction of the bilinerical; our times are for people who much to impossible a splittle of testical actions, and in any instrumen there is elsewic as promise me for the expense and insurrentence seffered.
Obstopic this psychic is abelig arrers to publicity.

Only the double of material leads her to offer her old to our complier, and only five eablest to conditions. Our of these is an expedity. I don't know what we shall do about this if she wise our print; certainly right up to that several we shall do all we can correct her identity. For her we shall employ the "Margrey." for the brother "Choose." hand will appear to our pages as "F II In investigating such a posterior oper us this, our April 1-car obligates to in part the oscillants expenses. Margory deet's work it so the in olde to pay her out expenses, and ours, and the lusters upon this. Her here is an accordidg from Bacter to from New York:

and since the Beston partiets of our consistee have had nothing it do, we shall for the present leave the case to them. Whether the, go to the prefixing of size to their, she pays the freight, so not no that imposed by see presence is either there. But she worther that if she with our prior, it shall be used on a fund to define the expenses of further unvertigation with further

It has been engereted that on avoid market with Margery and her betweenth, our freezhou freus-operat brying as from the import of round-detailes. think we might with count planshifts be during with a temperary to judge it he seconds, in the offset to discount these furters, but in any every, the fact stick now become oblives, that we are wholly aware of this single of the case, stad to present every reasonable guarantee that we shall steer safety

between the Notic and Charyblis which it affects. The wisings on which I have this prediction; outlier between the production of the though the control of the purpose. Unsets regard that I be large dark during he statistical, etc. He step he has a but of superplayment, which got demonstrates and during he statistical, etc. He step he has a but of superplayment demonstrates and control of the control of the statistical etc.

opportune them, which gots discreminged when the reson-ic harded.

The medium sits in an open-face enhant, with Nack valles at slee, back and top. A plast table stants close in frost. Sitters in appropriate number draw up to this and with the peptide from a choic, hands joined; any facilier sitters are placed permissionally outside the

circle. Cheere uses reside freely to multivale the psychic atmosphere. Originally the victoria stood just outside the door, and required mutual operation. On the core-sion, when a layous was deveasabled, the gentleman in the tell blusdows, and the durinous rong with the claude strains of "Tee, We have No Regulate". New the in-

in or "yet, we have No receives." Now the present stands in the room, with elevative connection and repenter, so that 2 plays without attention throughout the entiring Total durkness ustally presslis, but provision is used for variable red light, and for withs.

executation the te rule, rusting at

UR affert to remove some of the material obtained in the tray of the appearance of the better mediums before our Constitute on Psychic Investigation has hed numerous re-ponses. We have selected for our first etherian

as Feynts (Interpreted and Interpreted and Int medium is pies pries priescul responsations, and that interripe in milital this claiment is extent less seasons. Indeed, even if she prine she will not transpress her hobbis in this respect; for she spe-in this creat, the summer shall constitute a fixed in defrest the sex further investigation with further mediums.—THE EDITOR.

And at the end, his departure would be significant by "Zapa" as a payetic bugin. The most current search of the house which people is given without actual dissertion failed to revisal sta-ing the search of the property of the property and by-pool international approach for these nations; and by-pool instrumental a

The motion of the motion bands of the shadow of the control of the

view of all, the needle being sweing into accurate place without risble playaical ments; but the grandfather's clock on the stairs, though looked and the key act-granded, was stapped and scarred, and its chines and mental accumumated.

control, tables and at all and a proposed and at all anothing while the determinant of the second and at all the second at all the second and at all the second at a second and at all the second at a second and at a second at a second and at

methods are the feeling and less appeared at the delays meatherm. Or entire it Norman sections of the delays meatherm of the third and the section of the last less remedied. They had not assumed as a last less remedied. They had not assumed as a last less remedied and the section of the section of the control of the section of the section of the section of the control of the section of the last less remedied the last less section of the section of the last less section of the section of the section of the last less section of the section of the section of the last less section of the section of the last less section of the section of the last less section of the section of

there was to inster; but a semi-crotre condition was non-developed, in dustinate Objects use of the top-nation wise. Later be adopted a bonew whitey which is accepted by the sitters as independent. I have at-few and the efficient inspectation that this did came from conveyable berthere, but a whiteper is the bandoot seend to keeps. In any event, the present account shaw rather at entreases of chiese than presentation of chiese-than the presentation of chiese-than trill creas later, out of our com-

Movement of the senge-turn table has been of the clandout types; more shuffing, example; to be of slight restricted types; gave estimate, extended to be of mages, which with out the historie on the buble and straighting to follow it; extend tilting, of perhaps conserving more eignificators; and occasional full heritation. The tilting table has other home exceptional as an adversarion to the trops, today the mane code; and the singing table pro-vides a convenient towars of greating or shaping out

dividual attores. More set of the bestes path were the musical seconds first were bring presented last fall. Chester had a More set of the beauty path were the model needle which were bring presented just fill. Cheeke had a formalle had from "Successfor"; and offer cha party was morelated by the women most, his creating would be asserted by the women most, his creating would be seen to be a second of the party of the women most had considered by the women beauty of the women beauty of the women to be a second standard, and had offered would be been what theater called his "was withing"—the papells check, hand as brus a fathation string of a preplic check, hand as brus a fathation.

And the second s

well stand as a best for popular consumbers: "I can't seem to impress upon these impulator young norn that they musth't get about of their evidence!" they must'll pet shaul of finite reference."

New Margary is now prime-recibing press. If the New Margary is now prime-recibing press. If the proxy of investigation, I have no see with the sensite press, and the press, and the press, and the press, and the last sense of linear as witned as green. My Newmerle with two sensites as estimated and the last sense of linear as witness and green. My Newmerle with two senses as witness are considered to the press of linear as witness, and the last sense of linear as witness are considered to the last sense of linear as witness, and the last sense of linear consideration of the last sense of linear press. If the last sense is the last sense of linear consideration and is not sense of linear consideration of linear last sense in last sense and linear last sense in last sense and linear last sense in last sense and linear last sense in last sense

ad so on, of lift. Of itself, this would note examile in either di Of itself, this would point equally in either direction. A closer tricker conflict to better than pass of the charge of fraud as a joke; she might even loop in course as mind with this less to the enclosing of much such that the peritage of the conflict tions; it was impossible for her to rang on, or mean anything other than the fraud allegation for more than a mirate at a time. She enjoyed the home-play and usinate at a time. He enjayed the home-play and second militared thereiny, her I regarded this as only a aftery-valve. Her obvious suppressed transett did and appress are a near reaction from the steak of guad-iest operation or the shock of exposure; while in the author of the possible motive for the alleged froud size we indications of a controlled indignation which second very real. A consistent attitude of same-oran, of crushed and biseding interester, or of rigineous weath, would have been facetspanably easier to make

hings, and gravely explain its role in her iricks

talk Scrittmenty than this very impressive southplicity of reaction. esskiplicity of reaction.

Assuming growinsteen, Margary alls tooften. Thus, it the 20 days from Harch
12 to April 6, there were 20 seamers, including one stretch of 11 consecutive exisings. The size and constituting of the
authorizes sight alia to erithfund, and ter bismed completes of this variable.
Aince October some fisca 80 indi-22. Alles Christe core that is the first and the christ core of the christen core of the christ core tools have been in actordance; at least

was accepted for; but of several intended sitters who had come in as we sto, I could not teelify that none had gone upstains. Outdeferary, lasterer, if it is explain all that ecours, send do a prodigious let cuirs. Orefolerary, lawyerer, If it is a espans in the courts may at processor as a language about; repeatedly a process who notes the only possible vowel of guilt in one episode is about or clearly inserved at account. Namper, occasionally their that some learner incoher; is not Oceaner at all, but some action trying him out to see whether he will



This is the pigoen which, if we may believe the re-ports, was brought by payable power through the walls of the beans

chim what len't ble. Though he has, through archive and through finding, here gives numerous apportunities there to bern his theyers, he hast'll over get then he's as yet. Often in the force of each a lovel be says findly. "I clin't for it; who did" there's had been slove to scient on Thomasy. Or Pridity there was a longer walt; after which the table moved only back and furth in a straight line, in a fluided clearly distinct from the unual circular and.
The regulars developed the contribut that but Cher The regulars developed the continue that are to re-lat some other personality, was responsible. The pre-sorders code Was explained to pits individual, and the table. To a

was asked to jerk our answers with the table, with vertein of execution in motivi always "No." when this was clearly inapplicable. Opinion marked whether he wouldn't or country yet; twice. Three cross an inneriode, during which it was after-wards agreed that Choster had been trying to water its

IN THE case of Megad physical mediumship which our Counsition has not in date, I have found it necessary to profess on your path of few possipaths making the reader facultier with the general feature claimed to the restorate the mediumship. Obviously this necessity cash is every case, since no the case are classify possible. With "Mergey," our next medium. Notestor, the initial probabilities of permissions are much medium. Notestor, the initial probabilities of permissions are much ester then in any previous case which the Committee has handled. Her preset then in any previous one which the Committee has handled. Her mediumship in of such neurona opposed range, of such extrace inputs and impartance if genutes, and while in very interesting, that is because at some case of measury to spend the estiments of that her manifesta-tion level like over a complete insulment. I roud and apoligin for the exhaust of the critical railular in the present story; who says it is not collect for her. It will be present next meant, when I conserve the story collection. of the Committee's formal work with Margory—which at the essential of writing has covered neweral utilities, and which has been distinctly favorable so for as it has some.—This. Automos.

to break up the string. Then molecule, without the stighten prefinations the special was in full indice. The unant enginess were markle, particularly the Po-hoods. Two or these of this attens were marked not of standing; they and it were impressed with the special typicalized paraboses of the winars. The field supersized sold the ordinates were such that the regular strings intended the passeons as an end one. The strings is the strings of the strings of end one. The strings of the strings of the because year end one. The strings of the string of the because year

were mouthed approachly. Robbesty, with a viciner start, the words "Get the Hell out of here" were facused. If was assumed that the distortance was nesed by Choster's effort to expel the eth and that this animbeliae mounts was the interniors After were 15 minutes physical calm en hat she had been "nalest," but otherwise norma-All this was quite orthodox. The spiritualists, who-destrines are averaged sithings their religious asserare ignored in this group, betieve that the spheres or side our even are populated, not alone by decement business and beneficed brings, but equally by nearest-ed hielinguous, on-human and others. They better

these cell spirits inside the segar-room and seek to pre-custod; they believe the good spirits roofs this, and they draw a sagar but note the less alarates pierser of the tamble errises expenses to the madern Noterity's string was detaid of all physical featur sern personnel of the table, mainly by the stronger this time we get a good deel out of him. He cataline to show the table in straight lines, but was now about to pick out individual silters with it. There were in directions that he was expecially interested in me; and we get numerated reactions out of his on several we get presented resistant set of his on several quanties and remarks. By results of the alphabet we tried to get life initials. He seemed contrast, our mighted hissant, and finally reduced to precede. Her I been disposed to do so, I could have bloomisted his extensively from all titls, but he was not sufficiently orl-derable to froce as marching (footds whoe. I refrine from some specific fields). I do not want to travite Mr mean some specific fields. I do not want to travite

salvetice by other medicus. We stagged early; I walked out with two of the we support early? I wanter not upon two or to where alliers, and staged long enough to give the rap takes a chance to try it in my absence, if they would They did, with great success. The table moved in Chesser's characteristic fashion. The voice said there had been difficulty, and abritting that it was connected with me. The introding spirit had come with me; he was on a plane lower than Chester's, and better able to much us on that account. The situation was sectors but we might sit on Starter, provided careful watch be kept for the signal to dishend.

long for the signal to dishund.

In its entity port the senter thus uithorized was essentias. Ultimately, however, Mangary shot into the trainer signs, without the stiphtest worning; and R. T. (Single Tapper), as we had named litts, was to com-mand. The physical reactions this disce were con-cession. The section slicked the chair can fore under contine. The section slicked the chair can fore under and colleged upon the face, correspond the call.

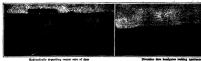
The circle was resistenced (this is considered of the attent importance in the presence of such a sets ure) with the grantest difficulty against her manufacgream. Though various induces theset noises were given forth, there was no exercise voice; and ments in did not seen to proceed so far us on Friday Not did the episode last so long. The hypothesis that K. T. was, consciously or a consciously, a pure investing in this time apply and

shrintely methaned. Nach freed would be to avoid the recoulty for giving the most performance in my presence; and so well, through her husband's sawilling new in expose Margery to this mailin in

fluence, to provide an easy way out when themse to risky to go on at all. The "Impaisive young men" were confident that we should have presistence of R. To and shadofferent of the medicuship, "In one would surely have led to the other the eletation had F. R. to a were of nome elarm.

If neither convices nor subconstru-frant, N. T. represents in some sort of deality of an artisal received moneyold whether decreases is not presti-Little opportunity was given his to establish an identity. So for an early judgment in ferrible, I should may the be was not particularly continues a soft-mastern. Printer's single price its presed up, not as an alternat to com-municule at all, but merric as an effecto create a disturbane; while Saturdes cation And I also may a different

in the attitude of Sunday's traper personality, as apriled Friday's. The apparent planticularies whith of the trans would argue against conscious frued, but het againthe subomerism suriety. Aside from his inderest on figure in his wife, F. E. felt that the largest topical the treat put only know that such a setting is pre-(Continued on one 79)



Wichita Dam Completion of Another Big Western Irrigation Project the railey is 20 miles, and its greatest width eight miles. The maximum depth of water near the dam at spillings level is 85 fleet and the average depth is 25

on the Whitis River, there was com-pleted during the spring menths of this peer at unusually large earthern does, by aponts of which there has been formed a fee body of water which is known us. The important union are named down Lake Keen the value to a diversion lake, twenty-six miles went of Wightin Falls. From the diversion lake

the water is fed into a canal system. Except which it fews by gravity through the feetle valley of Wichita to Wichita Polls, where it will furnish an abundant manifold and industrial water supply The ferenties of Lake K-rap, with a capacity wish full of 171,017,000,000 gain hea, will give to the State of Trues the seventh largest artificial body of water in America; and it will be of interest, Just here, to give a list of three large irrigation and power projects which are to be fruitd peabout the litherto arid readons of the western States:

the vectors Nation: Prevention is some of Bisphant Prevention is some there are Bisphant Parts. Now Nation, with an expect of the State National Na

water from the direction take to Wickits Falls, it is emption in Lake Wirkits seven siles above the city, which has been hitherto the source of the city's water apply. The present manicipal system of water makes not be distorted, and the larger lake up the valley will serve as a perpetual inventor against a water shortage. The people of Wirkly Palls will not you that attraces all has much the ofte brown throughout the United States, water to declined to make It better invest, where the new instruction artifest will new vide a water supply for a city of 20,000 take

acres of fertile hand in the White blog sales The most introveling part of this week, Joseph from the engineering engineering to the large earth strenge does which has been built by the leaders side director "T. II. This great work rises 39 feet about the valley and rateus, proces it with a continuer length of Than

(lattering to water from catchever lasts of 1980 square railes, the embath rasts forms a lake with an area 21,000 arres at spiff-way creat level, at an elevation of 1150 feet alone sen er like in 125 miles. Its test length extracting to



are output ever mace, some control to me, as unappeared of the impervious sits, which was deposited in the central cure pool between the side slopes. In this method of cutstruction, the first material settles down our of the promptals material and forms a compact mace which promptals material and forms a compact mace which prospecity material and some a compare ones in important to the passage of water, thereby person-ing a water-tight and thoughout the full length of the same from side to side of the walky. It should be

the dam from side to side of the willey. It shas associated that, before the pumping in of the our material, sheet piling was driven strone the down to a firm facility, so as to persent any se

The top briband illustration on this page is taken scalar asing the cash of the date, and sheen very cashed as single control of the gard scale and scale asing the cashed as the gard of the gard and not material on other rich. The illustration of the bestives of the page, shows how the questions object the bestives of the page, thous how the manning samp he converting or not through. The manning sample of the cashed as the product of the cashed as the cashed a

feet in circumference, and is paved with 36 brief of rick 36 insher of vote. The discretion dam which is 20 units were of Wickins Palls in 56 feet in maximum height, 4105 feet in longth and has a storage regardly of 15,085,000,000 palsons. It is of abrillar construction to Lake Keery dam, and centaries 186,730 cubic parts as compared with 1,467,235 cubic feet in the Lake Keery dam. spillings of the diversion dam is 300 fort. In legath, and its capacity is 100,000 perand dect : and since the greatest recorder fixed on the Wickits Silver in 15,000 per

end-fact, the diversion dam may be con-elfered an amply protected against over m. The length of the worth side ramal which conveys the water from the diversion den is \$4.2 miles. Its betten width is \$2 feet

the depth of water 8 feet, and the width of water at the surface 64 feet. It has a capacity of memor at the surrace on rest. It has a 1900 second-first for a distance of 16.5 miles Effect of Manganese on Plant Growth

Effect of Banguasse on Plant Grawth CRETAIN element that over only in very small constant in plant disease would appear to july make defaiting user in the economy of the plant, scend-the diseased of Agricultural Research (Hristia). The alternative three diseases and Agricultural Research (Hristia) and the alternative three diseases with specially perificial antifects saint, and the results abstract which specially perificial antifects saint, and the results abstract saint for the plants seller, and his respite indicate, at for the plants seried, that a very small quantity of numpusses is assential to produce normal rewith. Such plants as ratifs, say been, everyes, feel yes, and make to not contain suf-

figure to not extrain figure mangazers for gre to maturity, though a have sufficient for the ; few works. The lack agazone affects the tion of the young le



d Boat ns. The pos

erion, with but few expenn, the Dissel ough towbest, which

injection plumper pursps, which deliver the fact to speny valves in the top of the cylinders. The active engine For absent one hystered years the weard propelled by a starts public-wheel, rotated by massive worden rotreds called Pitmans, from languarche, single critater, am-craferaine etaines, has record its relie billy on our waters from, and the stem position steel the heat is in shallow water: for while a terred soon

this infection, the blood acquires properties which it did not possess before for example, the power of clump-ing the bacteria or awa killing or dissolving them. It was very natural to suppose that the development of these bodies in the blood to directly responsible for recovery from any infection or the fellure of the per-ticular expanses to gain a facing it successfully su-classic individuals. Professor liveredus recitaed, lawerror, that in certain cases a defailer proceeding expen without the neverteer of such holler in the blood, an he was led to the belief that their appearance in

a secondary and not a necessary separa to a protection angine) by the special cycle which the particular organies in the case of an thrax, to which the galara pig is very aga-ceptible, Professor Des-

praires experiments that inventation of the attent focults authencies has the perisonal cav-ity or thouse other than the skin, is not followed. by the development stiffedire in the blood, against subsequent in

deficite transmite to se quired and the gui pier, which previously at infection by the inser-

redks has proved by in-

oculation of the sain with living organisms is obtained. If however, the killed organisms are applied to the skin, or in other words, if the skin is vocatasted, a

lation of the filts with a very small done of it bucill, now are rejetant to very large dose. This bucill, now are rejetant to very large dose. This business is not associated with the appearance of auxiliardies in the blood. It is evident, therefore, that is

surplement in the minor. It is evident, therefore, that is order to should be entitly against anthrax it is necessary in horsesse the resisting power of the special theme, thought, the sich which the Bootlay suffered frames.

Profesor Hestodia then turned his attention

other Garcero, etch or risolers, typhoid and dynamics.

showing the two Diesel engineement the how; the two line shaf-us to the outboard shaffer; and the public wheels may solve the problem of driving alread, it does not receptive with the storm when its effectiveness when

designed by W. reay Herbert of relie, Tenn. The re of the boat have another steamer of est the same size stall eer, with which they we able to make cutsparticular of performance.
The old stemmer orient by elect engines of the normal type above a cen-surgation of T.9 possile services of 7.9 per-or coal per harmoner per hour, whereas the Detail augite does the same work on su-half a pente of fuel oil per merchany. The daily feel and lubrical ing oil bill for the steam drives steamer in \$40 per ten-bour day, compared with \$9,50 for the Dis-

set, all these figures be-tag token from the Fire paser's records. ther economy is found to a mythag of two stem to the operating flows,

of time in furling, the or true in inetting, the approximate switch receiving 154 lours per year. The "Harrey," as it is called, has a shed half and a steel main deck, with a wasdan experimenture. Site has a regarded an against a serie bow, and in steered by three belanced raddors, carll 18 feet long. Her by three behaved readers, each 18 feet him, her discussions are; length 118 feet; beam 25 feet, and need dust 5 feet; and her speed light is about 12% utiles per hear. Feet tooks sufficient the 120 tools are located under the engine room, and bellest rains for tiles are fixed forward. The cost of the lend cointries are fixed forward.

2

Profile and plan of the "Hu

pletely equipped to about eighery condens of two chinery condens of two Worthington Dissel sta-gines, four-cylinder, two-cycle, selld injection, di-rect recentible marine type of 120 homepower such, at \$55 revolutions per nimute. Line shaffa, to shown in our draw-

rags, ren att from earn engine to a point above ten feet forward of the storn, where there is a approchet and chain drive parted up with a sunderft outboard ft, which is driven at to 18 years. This off in turn, through ed gears, guestes the en paddle-blood at tal 10 terms per min-Thore are no es ner gear shafts external to the stals drive to fore-and-aft outboard shaft. Right:

The day has come when the sid impeints, pra-no dendig, high-pressure engine, with its extravagate con-sumption of enal, will be displayed either by up-to-date

sampling of east, will be deplayed either by Upli-teller source installation conjugating in citizency with land praction, or it will be defron by literal engines. The pilot of this heat, with a lightless expectation on river seasons, which as the for greatly superior facility in

puddle-wheel is ed into two halves. ed engine of the starboard portion, parties. This allieds exce ard portion, and the port sigme too affords excellent transcevering, which ad with half the power and, it neces-

t partitle. Annual is a completed with batt me professional with the saidle. Annual control of the control of

materiaring, and this, explicit with the economy of on-balf a pexicl of oil per homeyower hour, will obtained limit to westurn after segurites service.

Local Jan aity in Infectious Dis-THE tearly screped view that protection against pelbothes became in don to the development of company architect in our so the mentiophosis of the antibodhe in the blood in disputed by Professor data of the Pauleur Institute. It is true that after any folion say fadortion, or after inocclation with at impossite it would be best to varettate interimed wat by bring ing the wester of killed ergenieus in direct con tart with it. Expert teents on spiceds have territy out by eltisted ty education ring the Instruct of Injecting then entertained by

tier organisms of whi attack the litting cells of the intention. If the water principle main-tains in these diseases

then in order to produc

method Having obtained these results in united ex-periments attention was directed to branen lelage, and already certein date luter been collected which can be toterumint as indicating that, during enthrough of typhoid and from

beci is in two halves, each driven by its terr them who were its contact with the sick can be presented by the importer of tablets of killed barreria Another audication of this principle which is being investigated is the possihilly of vaccinating the skin of human better applied stational property in the same of hills and favorable. In these case the expansion develop evolutivity in the side, and absorb evidence is accuratellize that univerties and over our run be obtained by applying various to the skin in place of investming their spherienevady according to the practally accorded procedureabout from article in Values for Polymers II 2274

The Great Lakes-St. Lawrence Deep-Sea Route

Huge Navigational and Hydro-Electric Plan Recommended by the International Joint Commis

of the United States and Canada referred to the International Joint Considered for investigation and report, the arbitrability and the freeholity of a roote for despons shipping from the Great Lakes to the sets the Nt. Lawrence Hiver,

its report that the Governments of the Chitesi States and Caneda ealer late at acretaments by may of treaty for a scheme of improvement of the St. Lawrence outy for a senesse of improvement of the fir. Levenier free between Mentreal and Lake Ontario We are informed that the estimated cost of the costs leted project between Newtonia and Lake tintarie, an plants upplet before Westwal and Lake finition, as without for the empiricartie point, in deast EXEMPROBY To this must be added the cost of the New Westwal Ship Gozal, which would believe the boat expenditure up to approximately EXEMPROBY. The run comprise would shave it this easily. In the convolving parts graph of its report, the literature likely ways that the Consideral has brought expeller authoritative in-ternation as in the visiting traffic between the office-tive rice and converse points as well in between the

ne area, and cometwier points on this continent, and has reached the graceou conclusion that sufficient traffic nell seek the new water crafe, irrespective of new traffer crassed as the result of the opening of that

tale, to justify taking up its construction Looking at the probless from a poorly to time! point of view, w find that the region. thely to be tenefted by more direct trade with the British Isles and westers Berope, con tales a very infantrira

and progressive popula-ties of about 62,000,000 eople. The value of all fam gerty entraced with the tellstary are per cent of the total of such property in the entire nation, and four years ago, this region produced oversit, scots and grains to the sur te weeth of \$4 Mile

entries are to be found in the territory in question. 1909, SES per cets of our soft coal was obtained from the hiturinous ti-les of this functed portion of our The largest line ver producing States are Michigan and Minnesote, both configures to the Great Lakes. Together, these two Shirton records over \$10 per cent of the Instance output of the union. In 1999, 547 per cent of the paper rande within our bearderies came from some of the States that look to the St. Learnings under way for transportation rolled. In conclusion, the memory severals to \$10,000,000,000 work 43 per cent of that shallarly watered in the try ; and of the total of \$255,794,903 tune of freight traffic handled during 1920 on all Close I mil-reagts in the United States, fully 56 per cent had its

digesting all of the coldence entoritied for any again the N. Lawrence wateriors, designs that well-this sill of the objections to the undertaking and its pract operation are without femination, and is satisfied that there will be no hampering satisfied in time in passing through the holes and embass and positived autumn hancels that would firm parts of the waters.

Parther, we are teld, "The thereledes in inclined to agree with the statement that where there is a prito agree with the statement that where there is n pet-ductive interior, sides will proceed as for inherit as physically penetheshie, and that the farther inland they can penetrate the greater will be the on alting economy and the more extended the area benefits," As ex-angles of this, we are retainfied of the considerable tradic by cover-point stips which has developed an each rives as the Amount, the Yangse-King, the

belarence, the lower Mississippi, and on an exter stretch of the St. Lawrence bredt. These and other facts of traffic are offered as warrant for the assump-tion that the allowater brake by way of the Great Law-rance, even though it includes a longitu-tion of the St. Lawrence, even though it includes a longitu-lation raw, will be a clean-or and generally generally. and to Nr. Levelone, seen though the prictions integral and the Nr. Levelone, seen though the priction in the Nr. Levelone and the Nr.

Lawrence, the river has a drop of about \$1 feet, which Laxvenire, the river has a drop of about \$1 Dect, Watch to neutralised at the present time \$9 four examin, in-cared at veryfixe interests along the Guardian skere. The appeared plan calls for the building of a cutal on the Canadian side of the stewars which would have a

Mentimed. It addition to the two projected would be measury to 60 stone designing in Francis and 81. Louis.

All of the undertailings in the canadiags section of the 81. Lowrence, as well as the or of certain protestive works in the harder of would call for an investment of quite 888,000.

erric, should the depth of the catala be in 25 feet to 80 feet an extre seeker of \$17.0 he needed. This supplemented sum would five feet of added depth for all three propoboth the national and the

MONTREAL

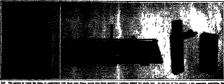
1,000. Something in

prions depth of 25 feet at low water. This cannot would not from the head of the Long Sault Empire down, to Convenil, a restor of above depth calles, and would have been till locks, 600 feet long by 80 feet wide, with a depth of 30 feet on the olls, suggester with a pair of gazed gains. One of the locks would have a lift of 66 feet call the wider a 25 or 62 feet. in the purpose of concentrating the full in the river

and an in the case of the case

provisioned. With the river is the outs for fine he end that con-forms here opinized in the past that or durange, and with the introduction of an unless them you very convertify located in the opportunities for the throads are access untriguent distant the weeks investmented without of greatly reducing the formation of fund | in all the critical section of the in appear and of Sabin St. Francis to the boat formation.





took for daylight me

ging Color Photograp Layrest

6. 11 Stere on a si

tich is then placed proper time the ben ng which rineing is under Then it is the box tato water. Then it is at the places smill the fixing is

It is well known y apperationing it is wan above, ing of constituent prime in other in but as it of ure in this case into short witch is attended tool me case to d talk acctants register recentric adjusting decies on the ed on a cell me it becomes of a m The result

ey of the pignisets used, which set from the elder curion pig



graph po-ted pictures pusses a re-siliving and there is an absence of the film. Naturally any rose the one triple-outs depth that are

— puringraphs are the obtaining of Direct toportions on one-tempolar through a stage beat the long to the late of the property of the control of the control

Social Significance of the Army Intel Tests PROFESSOR P E DAVIDSON there
Private Evently some of the gre
which have been drawn from the now well as
an arr y lookingmen tests. These tests
applied in order to differentiate use for dat

lity help to determine a man a social position. resing that the gifted minority should have agreeing rate to price amovely secur-possible advantage lee dispute the bell sions of old be trained white large trans-denied training because of an arbitrarie, pility. The critics gives a saturary and in the arbitraried datase who would in

Animating the Advertising Card

R 5.4 EUNG that other oil is said and done the
le nothing like motion to attract the eye, a per
tirel advertising came has worked out a size just not
7 animating advertising calche and violates digital ner by means of a delicate spring attract-our advertising cord, the vila depended upon to artento the delicate her thus securing the desired anim

nate it. At the right is el eo sa ta sa

factors a small piece from at the year to : moving part and pie un electronages to the eard in such po-as to attract the m-part. The electrona-is connected with 120 Cost curest or wift i battery through finiter r switching desire will makes and device will it taken man ben his the current it require intervals and the agitable the infected ad weeking sign in the ab some fibr driving power vite tion

A British Bureau of Standards

John Bull's Parallel to Uncle Sam's Most Famous Technical Establishment

urds, at Washingt at which is furnitur to every reader of this taugester if not to every one whom titerary exponent stops with the delly papers. And Gover British has its Nutl and Physical Laboratory at diffugion fast a half hours run from London. The

persilition between the two institutions is very nines the members of the Trickington staff themselves in the scapt to improve up n the toxetican visitor just what or establishment is and what it does, invariably on

off actual standed to and or ley accounts of the state-act that it is the British belieges of our Russeau of backards—or seen that it the British Percent of underly That the com-rison is a fair one was impression which a open of our staff got when he want over the place a year ups and should be the message which the reader will get from the pin-tures of the facing page As for our specific views, to 1 shows a programmer og mechine that is used fir checking the accuracy of checking the acremicy or high-precision graza, whether eat or ground. A very se-earnite pantograph repro-duces the stupe and position of the teeth upon a smooted plate with an accuracy but



this were not a sufficient not the view of the gener those obtained in nagatifed optically by fifty distractors in order to make may and option the detection of any defects however

Among the special markinery is an appearable used for investigating the endersare of automobile springs under ribustion. The bles here is not to determine the nability to breakage under the extreme shock which seems used in a month or a year but tabler to learn how the spring will stand up under the collings stress of the millions of small composed on and decision that constitute its daily results. An essential feature here of course is in know accurately is w many vibrati na the regime could imparts to the sorter in a given travrai of time and our second view shows the process of she king the vibration counter. It will be need from the meaner of the spring that the test doesn't have to

step for this. retal literateurics is one of the item jects of investigation time date and it of course de-pends entirely upon the seasonst of light received from noticed service on deter thing the volume of artificial ta process from any it a declight librate received from the f ur quarters of the sky. A special serious and photometer are used the serious that receives the light being the opright structure of the right ectives the light seeing tile of many experies at the tube of the [1] (spraight while the [1]) I meter in its the tube late will I the operat r in [Wing The fullington laborators has to deal freely with metale and our next photograph shows the high fre-

in general of letter furnished for caviting them down. Here to be a 1 little of large one of high frequency currents climatering, the end if Time is no direct metallic conperforming transfer in the second mention con-pared in hel ees the less in historia is chericales and no featurative at: The all alife has like article in the cent e of the pi ter is the former. The arele-tant seeding over it is waring a take of special place to protect the even for a tile less resisted through the bill selected were not a sense a latter to appear a more to product his even fr : if the less reflected through the observation which we The in their suggests the solution of a pretty print the company of a am that would be sufficiely insequence to light arm and sufficiely ; one t the sharter radiant

of impulses for this service mt ampaines for tion wrote. The classics tieture to which our exerctor attaches he granter 5 will need to interpreted n to those fa-ciliar with the technique of the lohanners and Brite-ages for measuring in millionible of an inch. This is ter machine for graphs the gages that do this Our cuts where shows the reduction generaters that the Dr bight respectations the vertex which is done to the boat parels by the flowlife thereconstar. There in-streamths recent this prosperation of a formary the course of the effect on a small thermopile of the heat realized through an observation had the death of formary. The view there is acres of them internanced being checked appearing one anchor of them internanced being checked appearing one anchor of the find of a large gas furnished.

Look in the group is quarter old riseal, the column

of culturals of limit steel or committe, such as any part in the construction of large factories and holidage throughout the exactry. This machine will account date columns up to the length of twenty feet, attheting them to presentes as high as sixty tone per exacer lark

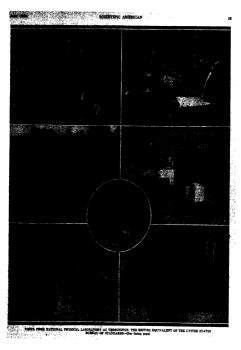
A STATE OF THE PERSON NAMED IN

varietick used in new standard or extremely all sice was suspended from the p slided sing these wires man sing the vires until a secon reflected. The distance beth present current was accepted as one-half of length. A calibrated steel tape was used for distances on the purallel when. A series of ments of wave lengths of the bereity of all ladicated a variation of only one millione

shows in one of the photographs, a range from \$5 to \$5 meters or kingries. It was calibrated by wire system almosty described, on the roof of the Botto Laborst Sundards. This ultra radio-free sizes of a single turn of ority, her with the terrelated of which the terrelated of which

equired a special type of re-brared a range of frequen-cies from 15,000 to \$7.00

es of they share radio was denses creations the part amplitude in applying the part The two only used in this good for the plate craying and the or other—were speed 118 inches er wire The latter scord to a 0,00005 m oter with two



to well the upper supp ers of wh to tree by the w rimes so for an thirty feet

grape vine and probably before his term rold abovetors were in existence, engineer ing facts in cable construction were conmost rearried by they max-ered and sight-legged creatures known to systematic at adjustes so the Arachabia and, to the less ul actualists as the Araciditia stat. In the less featly inclined, as adden. However gravestly allowed or actually abbarreds those lass itside his may appear, their constructive skill should mpel an admiring consideration. Even more hand by in their positive mechanisms in consistently destroy-general of mails most pertichers insert posts. ere are total process of the Arachelda, most of

so represented by contents forme in home, garden, after and worthern, but note introducting only those with for engineering ability we most first with the orb res representing everal fundlies quite distinctly exercised, though with habits not very distinction. nos they are all, franks with warlier indian-as concras the nearesty for killing to obtain trappers and source builders, for wifets purpose of leg long cables taut reportly placed and anchored. -in higgest measure hereditary, of course pot too strong a term to apply to the always well spen and adaptive methods for haliding these webs, n showing an individual risely of effectiveness. The of our garden raiders, Kipries information, a used form within the easiern half of North America.

d occurring also in the Wool, in the builder of the it deputitelly regatur, presente web whiteh, same it deputitelly regatur, presente web whiteh, same it sky other, persists upon one plane with firm ng stranen deviating from its fast serlage.

A tre rare's over six or eight lactes wide and to se deep over the actual entities fraction, though supporting rather any extend dram as much us aix or more, fraction on the height of the proof the above what may we've as an alleburge bed a suffection space, promotily among fellings, be-to tall words or sometimes deed and maked testing Sector—the trees to new testings which the garden goes about newtracting for web quite differently most other allied species and in the observing the allogsiber are species. The show had at fine the top cross stratel, but depotely upon two hearth nd onlies as expects, one on each side of the selected. To the end of a first land or range she left disces in appearance of a first leaf or reignate size the silient legitating of the strend that is noid behind her and drops writingly, analoging this (o-0, in second Disstructions to the free fire de, perhaps upon the greated, or to a herisonial h, upon which she erooms to the other side of the a selection to silk at six accepts offers by declare

the two tetilosi rabbes mode beyon such other make up one calde to a closers leight town its non Hittle rigger furtees marker line to be them heating addeninal epitterries aren from the colds she crosses again and climbing the other side to at once more appealle (a), takes in the whick of net space street by working it. Willia bor two pages to bee she draws the stretch so that that when it cased it defects the vertical called innording and first like in the imposed hericontal cable which he are alterationed to her spinning everal sublitional pon it. She then repelled to a point (e) along not it. She then repelled to a point (e) along and the distance from one side and attaching ane the runs to the vite and doesn it alrest an establish

e, again eating the wirely, drawing the returnated

The Earliest Engineers

How the Spider Applies Correct Principles of Cable Coustruc tion in the Fabrication of Her Web

By S. F. Auron

tigic and attrebing it (f). The letters becaused table (2-y). In then again, though processly visitoral stretching and the outer framework in complete. has seen und one come framework to complete. In a seeing unstreat all of the residently streads set laid, the first two merely creating outs often from the bettern and this point of creating complete the control of the web. As it is desired to have this control of the web. As it is desired to have this control of the web. in a verials place, paperally about sto-fearth the dissen what above of memoring is necessary; all Burtist itemed would have to go some to best it. From this center the other reducing screens are stretched, as shown, the little suppless gaing up or door one already in place and currying attention to be deposed at a prein pines and currying interler to be furthered at a pre-portionare district (see or y and at xr. Each sizes she returns to the centure she passes a few less from one enfacting returned by another in order to detectable the distance between them and facting a space has wide the just in a stather attend. The question noticeably occurs: to this resons or more untilisting location? With the frequency distalled, and there are seen



starts in the center and rapidly lays the first and a open spiral, going round and round and attaopen spiret, bring recent and remot see account of skill at each redicting strand until she reaches the state cable. This, however, is movely a tracting or strongly using device, posterly to hold the radiating strands finally until the final, more closely placed and still spiral to spira, which is commoned insuediately as too the ester edge, the spider eating the first spiral

girs to build in much the Note vector as the parties to the height of the word had raikle opposite web maker to the hig black pro the powers is reported to do the anches and pold reclaim aption. metricalled and extraority referred to in the popular besks in Arghee. But after placing by side rables like there of good orb ways en, largely reinflored by lateral lending callies at ugated the beary jee of leading crossbuccers, large realing becomes and fure-fr-ing less and methe. Each ring rabbe start radio

ize street is also strength-eted by desiding and trab-

porting struste of arguages, y have such strength that bets and the stood grass stalks to other bend or been.

The majority of the orb was their web constructed by stretch practice the constant and effective as often elected and fraction. This must lightly developed table to be foundated, unless it be the pressible with

estimate, values II to the possificy with a citized of organ variety of the notable proce that a very -and lowest prign mass of esting revel, paid on a state price of the price of the citizer with paid patch by the breeze. The first lattle filler hands a patch by the breeze. The first lattle filler hands to the became did not any other will show the pri in although the price of the patch price of the price of the price of the price of the description are the price of the twick of the price of the description of the visit of the twick of the price of the pric sign decreased, descrip is accretion if the tellar, Notice and may be recently a content with self of the Notice and may be recently a content with self of the Notice in Section 1. The Notice is the Section 1. The Notice is the Notice is the Notice in Section 1. The Notice is the Notice in Section 1. The Notice is not may be there the self-ratio as in the notice in Section 1. The Notice is not self-ratio in the Notice is not self-ratio and the notice in the notice in the Notice is not self-ratio and the Notice in Section 1. The Notice is not the Notice in the Notice in the Notice is not self-ratio in the Notice in the Notice in the Notice is not self-ratio in the Notice in the Notice in the Notice is not self-ratio in the Notice in the Notice in the Notice in the Notice is not self-ratio in the Notice i

equals this quere-booking ensures in explanetage skills, the proof beingth of the crose scaleta, but deviated and infect howers said the rigidate are quite experien-tation of the control of the control of the control phase of the frazer notice said skilled from a said look phase of the frazer notice said skilled from a said look direction and infection for some control of an design that there are not the control of an observa-tion of the control of the control of the boundard or collect spaint. Directions department of the columns assured than some we had the spaint of which, these directs in direct or not to control or which, these directs in direct or not to control or fles, goots and magalites, is bated the grant in the second the states also gather due and and agreement the states also gather due and are spen too registly, often in a few hears, in prominent places. There are certain allied both spider the exists make static while with the added duty.



and a typical wab, with

Inventions New and Interesting

A Department Devoted to Pioneer Work in the Various Arts and to Patent News



bing it easy to pick up a gire

A Radio Log for Shifting Statio ONE of the better known of the ratio dials; and in order to get a given bread-testing station, there must be a correct setting of each of the three, according

to the wave length and other charac-teristics of the station in question. This involves use of three things: either a long list giving the three settings for each of the stations which one is accustomed to take in on; a letter secure that will serve the same ond; or a del-ing expedition every time one needs a shift of program. Designing that each of these with active brudes certain incurvationes, an accessor maker office a clear little darker to solve the treation. His like apparently is that the list has the few apparettly in that the list has the pre-ent inhovest objection; but it is awk-word to consult, and notes unknown to heep to derent shape. So he provides us a messas of delay both these things, The first winds on one refer and of shorter, in the first of a leng tape. It corries a printed list of all of the present toget exclose, with blank places for the use to lasers the little, local once. He has to learn the operant settings for each startion; one having learned them, he

station; one having learned these, he made them down opposite the nature—and then he has them. The list until yet depents, only get abuilted up with other papers and het, said a given unity can't full to be fromd, by turning the knot partil it apposite, with a relationse of officer. The ortains list, as supplied with the scent, curries 216 stations; sixty inportant ones liened niphalet-free, the recenting 125 following,



picked up again with the atmost sim-plicity. This is a large improvement over fishing for a station, or trying to er when it comes in. Keeping the Dirt Out of the Carbureter

MUCH dirt and fireign matter price
M buts the passible tank of an autonoble and course treable in the opention of the mater. Part of this dirt is got at the moon. First at this dirt is the day for the etablism in the guestion pipe to ratch it and the result is that the defeate valve of the motor becomes deaged. This new device for fill-day the guestion is attached to the vacuum



level. Suspended in the best in a bar of close-testigned channels skin which allows the guardine to pass but stops the water these possing. Sempling agreed through the channels the guardine in puri-fied of all the dict as well as water and the imporition does into a heavy class the imparities corp atto a few years look which may be conveniently cleaned one at interests—and which advention

Quick-and-Easy Washing for the Hair-Brush

A Protocolic matchetown and orben uny other class, n large realization tenance of anything that goes hate the hatch of the general public must be underson, or will be neglected. The car the control of the segment. The control of the cont

A Bigger, Better Finshight

In this pertable electric flash a power
ful my of hight is generated by two
day sets carried in on attentions cost.

uits a **198**0 moved of light or 4 mg which, it is claimed, can be therea up eighth of a mile. A post-less is remembered; arrested as that it over he manipolated inetually in the later. Tager and thank of the hand which curries it. A wire relationed glass baving a thickness of a quarter of an lack be fromed in the swittging door and wrives to count the swittging door and wrives to count the switter and half from

Directive Radio Bearen THE flarests of Statebarts hav devel-uped a new type of notic beavan by the aid of which a skip or glophon the aid of which is able or alphane equipped with an ordinary receiting set can be guided along a simplet come. With the types of radio beavier new in me it is pressurery for the skip to use a direction finder and that the position by getting the directions of two beaviers.

are inder the pilot needs to know only the new bears to go.

The new bears on spirits of two sails attenues set at an angle of 135 degrees. These are connected siremanity to the inconsisting set, and one letter of the signal to work over each anneator. An anisona of this type gives its stronger rigani in the plane of the coll and no signal at right angles. Along the liter Niverting the single between the cold the signals from the two spicenses are of equal investig, but as soon as the re-ceiving set in massed to right or left of this line one of the signals become necleonidy londer than the other In a moved test of this device on sixplane was from into Justice from a



A uniform plating of gold, seeding no beiling, is laid down by this cett Interes A and T (repeated, the A helig seet on one coll-and the T on the other. An automatic derice is used for setabling and for con-

A Handy Shoe Rack E VERNETHOO'S agrees what a nelvanor a clear and matters extense have been devised to ministrible this moissine. The shae need: illustrated seems to have wired the problem. The rank can be furthered appliest any with or short star and experimental matter patter of shows. The construction of 10 is very obtains as a reference in the surroving will show. a ricert and variety extense have been



Tests of Precast Walls A NEW style of well known as "Not I's some was recently token at use flurent of Sundards, and was found to ecopate favorably in stempth with walls of common brief, It is thought that it resid by built race charging than brist, on the skill required in hotes the wall is built up of prevast mortal

blocks, risch of which is 12 Inches square and so shaped that when they are laid together hericontal and sertical passages are formed between tiese. No morter is used in the construction, but after the wall is built to a certain bright these tassages are filled with a constitut of pain of a bandred relies detent, the pilot relying salely on the beauth for ment merter, hinding the blocks into a setid mass. Reinforcing burs of appro-The signal conducts of the printe wright and number are fred

Historico-pound testing markine, were to feet with until 9 feet high. There were nine of them, in 4, is, and School thirty 200 possib per syste lick, and 200 puzzels per square lack is remain safe weight had in ordinary lottling

Gold-Plating by Machine

Gold-Parting by Machine
A N interesting device that has reA interesting device that has reA centity been registered for potent is
the small gold-platting unit silantested
herealth. It is particularly useful a
doctors, jewelers with numericarters of
small necessaries. This publisher is a
portable outil and very compact. In portable outsit and very company, as weight complete with the two dry colle that supply current, only \$16 possible. It will deposit a heavy gold vesser on all gold depent to of such nature t



se-storage with the aid of scially designed rack



ry to leaf the plate in ceder to pulled It, as the article plated re a bright, beeing potch stuply when

raished dry after being removed from the plating solution. The carff is sold onto when not butteries and plating whether, self-contributed in a political numbership carrying care

Something New in Shingles A RECENT investor has been in tor abgive. Overrowing the elements eing and scrutere oppilation, and sixed solion of rooting littre. It proceds appeared and revenue specing of the siftgir in time different direct tendy : sectoric space between shinging prograde weather expense, acrairs book of either is or is so desired, of

center of allighes over the other It clears the space between shirtness, preweeting water, sawe or days from being blest up between skingles. It laids the best of the shingle right to the rest, perngetlag wingles from being bloom up at the best, thereby presenting mater, store and dest from helds bloom up under the shingles, and in boice the shingles their to the roof, which will come the shingles, under you brat, to real together. It can be applied but the one way, which are singlestion sensitivity and eliminates

numerous complaints cancel to fugity prolication. ignored curpoter or noter. No take or type is merson; Los the first stands again with the not ence, and the device pega the shingles in cloubur alibe very serge the security in section their ment; in other words, dury the corperbut or meter's chimiday for hits using this dealer a granter weather orposter und a greater studies bernie shingles can be obtained on overest of display being lield down at the butt,



For more correspent handling of

ade circulately materials By lacre last the weather expensive and space be tures the skipping peter shadow the is obtained, which there was the needs tectami leasts of the red phoneruph curefully for the feeture



New composition elimpie with many

Water-Level Indicator Plus PS ing Device TAXE the place of the usual re toe mesie rap this embland design appeals may to \$5 the reducer with rater and as well place a constant in Graties of the water level and in always in view and when it sinks respected dated to the rese of the di-cular opening it for time in add poors water. The formal opening at the tim-ic of a shape widel, makes it easy to post the upter from a pall without spilling and as it is always open there is no perceity of recenting it for the solution of water. Applicing that might ring the

cultatur tolors by home out by me sman on the ladde of the coming. A Truck for the Ash Can THE garinge can and the salt bernel Till garings out and the base of the property of the country where property where property where property where property is described beauty. The track NAVES WITH THE THEFT & THE THEM THE relief states to the rark. An attachment is contain! whereif the larged in heal treat to place while it is being treat

Belt Action for the Shotgun THE ride has been making much finds stricks, of hor years, thus its cum mine-in-gray, the sketger. At least are of the hig discretely interes the too pieces, business, in turn effects and with the offenting, by one of the prominest American regardanteers, of a left-nest of alonger. The bulk action is of the 'upture and pull back' type, steple in "upture ned gull hack" type, single in the parts and absolutely positive in effective and connection. The half open with a powerful become update a care, which insures ejection of the shall. The herech is featured by a wide, comp opening. The goal is readed by politing mea-ward on the firing pix. A convenient desture is the simplicity of take



CONTRACTOR OF

Prolonging the Life of Feeging Dies A SERVER has effective method of pro a maging the life of shorb-coulding tools in described in a recent least of Nachiery. This method, briefly de-scribed, custons in multidaily maintails ing the disc or hard with a scientific ing the dies or held, while it wen all a temperature above that requiring from named operation but below the compen-tures at a high they are hardward and drawn. All previous attempts to seems pind this out the filter and the control by customered by it. Seighanth of Breeklyn. While is under the drop-backwar the dise are namified at an artificial best of 400 to 450. degrees Fahrenbrit, by the use of gas humans. The first set of the operated In this way produced 8000 flegings, in shoul of a few hundred permitted by the abl method. The facility of application of



or plantiers, when a tight is required in places distinctly remain from riveter festeres of the derive are that it what removed it the neither are that it will always remain upright or if not-density levied over will attornationly right their, doe to its weighted better. right most, due to its weighted better. It allows the user to wind up and work within the contribut all the ried or refe-Dend electric mits to present the cost from herming kinked, acted or other wine eratilered. been extremien largue are mostly swell



A heady radiater attacher discharges two function

satisfies and is usually provided with such heaps to allow them to be used in unty part of the establishment atthough de brand often med pransplantly arer its you attachised The sur! menty lying bounty in el grant and other title which colle



the flaces of such places. With this de-tice the ping is inserted into its secket and the heap very be corried where it is product, the wire paying out a sufficient length to every the distance, threely pro-vering the mediation of the wire. It is at mentracted that the large may be placed in any recognition pushing, or lease from a respect when desired. construction the device consists of an construction one oracle consists of a cord container, a holizer spindle rotat-phy assumed within the container, a contex shaped weight respected with the spindle, the whole rotating on a friction has bearing, a lamp secure structed to the outer end of the spindle, and a lawn guard excluding said necket and rigidly negocied to the spindle. The cord-extenthe centainer, the base and of said cord enters the bollow soldcle and is not mented to the socket in the originary one negriconi way. By tolding the centainer in our hand and retaining the lane

great, the spinish to the being rotal therety country to the country country to the woman of the spindly within the combiner. Safer Automobile Light FROM out of Cultivate has new one

FROM out of halferine has now come on universally light that gives triple marries to approaching and paseing our and providence to help reduce the name of providence on the ranks of America Named under the running based. green light shoul gives instead watching to appropriately motoriets and a red light to approaching monories and a red liable mounts these consing up from bolital. At the more time, a yellow side-light ensi-dermount leader the cur always insular dictions how much clearance they have. Already to full-forming one high harmoni-cropsity how attackned in per sent re-tocking in collision insurance to comencrying this tight





trolled steering that give e little car many of the de precteriation of its bigger bee

For Steadler Steering

DRIVERS of a universally popular water of light on may now "flover" over the country with greatly like reasoning control mechanics that brings all outres are sentenced on the sentence and control mechanics. the ofvaniages of worn-gour secretage without any secrifice of fruit-liky. This ering control derive classes anound the steering culture and unders to the car frame. It is controlled by a heart colled spring, which looks the from and even in least; freely gravel. In edition to increasing greatly the case of severing and control, and the safety of operation of the car, this perderice is said to bring big savings on

Exercise, with Complications FROM Les Angeles comes the access-pariting photograph of a makel va-ercising device, which may or may not be an practical as it in attached. The appropried object is to not a kirk ieto the dally acting-up excertave which they do not ordinarily possess. The vic-tire—leg pardes, we mean to say the subject—strape birmed firming into the revolving hazarness, let four, he bend and by walst, as illustrated. Then he esta the hannest residing and, we judge from the account that course to us, he is extraced to maintain a sufficient some of where he is at to indulys in the usua esic jertion with his land-ob riesely, not with his feet

Using Up Worn Steel Rails NINTEEN mills in the United State-xed Canada now are singuaged in the convenion of old steel rails have been and shapes, charitating an important tak in the chain of economy and con-



ntain Pen for Marking Packing Cases

Tills "function yet" in designed in take the place of the old streets; and a tase the place of the old strengt and arms; corridge per and bench which it fees very efficiently. The "pen" is made of frick-injured leave god the "pen point" le toude of felt and is so constructed that the first of tak is regulated by the pressure of the user's hand. The "yest" which is about twelve insides long in enylied with cap to come the "pen point" when the "pet" is not being need, sua-ing a very efficient, compact and rhum outfit for marking packing cases and

Compressed Air for Feeding Hogs PERMING have by means of comquestion to speed up the handling of stock wittle being shipped to market When a traitiond of hops are to be ded to engine with grain our stracted rates using on a track parallel to the stock train. In this grain our is a feeder, which In simply a metal began supported at a ietz beight en solei An air has extends to this braver from



us for feeding hops with the

the reaction and determ the room or od grain through a first lose to the care. With this sands, feel can be applied to double-desk ours at the rate of her bushels every two minutes. Grain conalso be trunsferred with this contractor from led-order outs at a decided senting over ordinary methods in use, so we are emerged by the inventor.



office the punch of a revisiting hammonic to the daily setting-up exert



A Self-ejecting Cigarette Holder Oze of the directories construct with the use of a eigenvite balder to the of febing out the butt after the sawke is trained. The objects burns down to the helder and one's fingertally need then become fictions in the little end is

not to receiv where it is no longer Now comes a Newark, N. J., name



factorer with a digenete belief banks a little weight which in free to sever a man sugger which is the passage that evadors the ancie, and to this weight is attached a short wire ending in a right-engled turn which does not show in the Unitedian. When the excite is railed, all that in presency to do in to give the heider a scart little step and the weight down the rest-the but; this ent, with a sect-enti-tyting ciles.

A number of other features make this indice marks of nation. The hore is made right-it does not much the right the druft to all but shot off. In addition, the leader has a large reality character which expeds well negative the menth mi, sol this nedrate the influths The tip Is elle from the follows threats), so that the weight which ejects the bull may be expected by unceresting it, these peculiffing it to be stiped clean

or marked out orbit abouted Tur-Treated Concrete Resists Salt

Action NVESTICATIONS carried on by the Sures of Public Books on the waterpowding properties of water gas for horse entireful as a meets for anterior emcrete from the active of salter missions. It has been found that creds water gas ter large a specific viscosity of from 8 to 12 will enter freely, under attack the 12 was easy then, their attachment their research table sarrier and in harpir simpled by the indrated county. Convert drain tile an treated have shown to signs of digit tegration under test.

YEARS up a peeps logisteess or Y tied in a sparse's populated valley of western Michigan on the balks of the Grand Elser. One day in walk ing over a newly arquired hit of land he natived on contropolog of a familiar Be bir te ta en alline strategies. He to a attive way with his welking stick

nateded blos of a sketlar exp from which ninke-time is made lieds of it underlie and overile unby arres to Miristers. Some Dos on the sta for and extends downward a score of

fort and open quarron are employed in the work of recovering II. Again, the suck is clearly guarded by over-tyling and and lies many feet beneath the surface, so that termeling be essential.

The tenung loose of the substance is accomplished by blasting, which breaks the rock to into large circuits. These chanks each as big as a pig's bead, are carried to the crucking mill where they are greend toto small recess these to be named between insurance stages and ground to etill further finences. New the crystals are mody to be carried to the fee, for the terrese of ral-ining. The fire crystals are thrown into the lecties, the spoiled barrath and the in-

ture test-ture of the neck is, when sub-

large the paintine lines a seething to or fluid; the belling occurs at 390 demblithm of the coloring pigroupts. physics, are crude in firm and custo in shape; they, two, are ground and regroups, total and relaci Latter substitution) arms after and tale all aspelier, thorwing the powdered mass. ligher and thirter and the other nattirks and white particles are thoroughly

Making the Closet Moth-Proof L'Ennergh authorities upon the su A let leaves upon as the difficulty of getting rid of tachs, the experience of a stromphere, in which these perio will not records; and the much hell, the owher thest und the rainer candle are study families and rather house's mean



h is said to be particular

set alice of a wooden piece without

for perriting such atmospheres. Butlet or elaborate, but correspondingly more effective, if we may believe the claims, is the desire (fundated). The colladrical er drive a faid down on to the cake below, and the result is a chemical combination in which the roots com-Retfle, both for the onner and for the lower tomber, may be purchase In addition to its specific action systems math, the modern of the continuous eres mild and liquid to a preeral dis-

Handy Gadgets for the Amate Gardener

A LL those who have purches leave the father purchase to the father purchase to the fine when any operation to required near the areface of the smooth From Variance we have a knowing man which weren in neive the problem very effectually. It is trade of rish or straw and the better in water-proofed so that the damp and dew will not strike through. These pade site very extensively used in England. Another some of anisone to the peran about the state of the trees grow where let one thursday before to very fugitive character of his bads and appliance. Near- and fromt, twinthan where he wents then and where he thought be last put them. A recently for this is offered in the basiset High-It will still perhaps, regalar a cartain concert of atmosth of saled to put the trouved and the eligibers likely in but the wire and the siring, at least, men first. And then there is the added contradence of keeping them together eversight, finding them will in the some place in the restrict, and furnity a

handy rawson of converienc there all to

Trimming Wood Without Crushing When the new remarks per is used the wood in not crushed

but to not up on to large a need straight and smooth edge. Mit all larles is the total carriag edge of the Smile and he welling guides on the from any rough up to 45 degrees may Airchie Ballast from Engine Ex-

PLACENIA best of pipe above and in front of the explane of an airel - a device developed at the Forest of plants for cooling the extend game letter release and reptoring for se failed the water they motals. With out this error us arresp now was a in flight because of the burning up of gaveline by the seatows. This makes it necessary to valve were of the lifting

to keep the ship in equilibrium, and if british is being used several dalla morth of it will be then wanted for one gallen of gaseline burned.
Water in formed in the engine exhund by the embands of the hydrogen in the position. The hydrogen takes up-right times its weight of oxygen from the sir, and the water moderated in ap-proximately establish the weight of the Under exceptionally fired conditions 190 reports of water have been obtained from 180 peepels of



lete increasing ettention. In order get a definite libra of its months have utherities recently tested upo milket unit with a roter \$50 mas. in dieta designed for a head of one more nets made at the Lilia Edet testing sta-tion of the Water Falls Department. showed the turbine to develop 18.9 here move with 147 case, the efficiency being 85 per cent as a maximum and 28 per cent with one-quarter load, which is a recursivity good perfections. larger Kaplen tombar art has been de signed for a maximus output of 11.20 spower under a head of 6.5 me

anactic has, according to the claims of its magnificances, a sumpler of advan-tages over the constant alackin. It re-quires no labrication. Since them is quires no intricetion, com-friction between the surfaces it per friction between the surfaces it per a cushioned shock pather ti ent effection is reduced the liability In oddfilen there ar portion advantages.

turer of heavy tracks, the rubber spring sharkle has made good to the extent or running at least \$0,000 colles on a fire ten track officert approviable wear. A Novel Foil for the Pay-roll Bandit

Sand operate than the armorph handingsted our is new offered as a fol-to new-roll handles. It measures of a trici

earched in which the meany is to be ear ried. When extacked, the presentary

province a lexiton in the handle of his strip, which wis off a number of con-

gray, when we set an in manner or con-cerning surely-bound, held in the bottom of the grip. These will have for rawlve minutes, three-ling out a beavy smaled the while. Not only is this sufficient in-flication to the whole world that some-

thing wrong is taking place, but in the event that the bandles according

away with the contents of the said after all this, they will find the bills as after all this, they will find the bills as discolored by exposure to the chemicals that they will be anable to pass then. The

only way to got the value cut of these will be through redenption and yest Parts Sexual to expected to display a certain utild curiodit, when they are

effered for this purpose, us to b



ton while under more conditions the water yield have rup as her as 10 posters. The device remains executally of over 2001 feet of one lock absolutes tolding siver 0405 fack files 2 weight als 400 reands and will handle the exhaust

Tests on Kaplan Turbines A NEW type of water restine designs for ProGreen Kaping of British -Simila for the la rus By Works and one of 450 in

for direct coupling to an electric generator, the number of turns being 625 t.p.m. Its reter is upwards of 55 meters in distance and weights about 62 term. The relating blades of the noter are meemiled instructly by a regulater and a service-series fitted into its high. Porsess toxialistics of Kaylen turbines in Swedleb nemer alanta comunice use unit of 100 mer under a beed of \$50 m izatatied more Furnity, one of 400 large power, 42 covers at the Olivie Electric

6 meters, at the Hitch Works

The Rubber Shock Inc In place of the orthodox metal she and spring held construction, a Took manufacturer has substituted her spring sharkles. An shown in illustration, the method of adding as ing power to a cur or truck consis imbedding the ends of the a rubber Morke held fast in me recover series need goes as meets a lags is such a measurer that the read reliter in freed to take up the es today) stress brought about be of the cut plus the

right of me car gras her speed bot. These reight blocks and spite these the citation is and parameter phrosphilad, and this pl spit was let into the majoritar. IN IN COME DE SESSE PE to the actual position it on breaks shown in the other

got that way.







markably specialized tractor for doing the spring road-work

eating the Het-Air Furnace noticiting the inst-arr Furnish B's upplying sense mechanical means of force the air through the specime of force and flow in a more positive manner than is possible by depositing upon the difference in the weight of two chindra of six at different perspectation. it is oblined that many of the uncertain factors in furnace tostallactors can be eliminated, and the operating expense reduced. This riceptation can of course redowd. This recognition can of curve be lowaght about by awars of a gover-blewer, lifet the reals objection to the one of hower has been in the face one and tight operating cost. This has been and tight operating cost. This has been to be a supplement of the cost of the passes ever the firmace, all the little, re-paratives of weather conditions. Further, when state down, it usually havens such as obstruction to the flow of alle that the furness thinks in other as such as forced in the cost of the cost of the firmace thinks in the cost of the flow distribution of the cost of the cost of the furness thinks in the cost on such as forced in the cost of the forced of the cost of the strept on a basis of differential gravity circulation. The answer to all tiene were is to be seen in the stantation on this regar. This circulator emission of a small motor driven blower and a swiss

face. The slower is coincided in the device by recent of a small pipe. With the blower in operation the current of air expands in the device and induces an additional flow of air through the Exit the Six-Horse Team NOT so long up- three of us who had arrived when we have the cold, "Rey, Skigzy, o'men over—they's a read scrape with six berses, n'everything." h six berses, n'everything? Supertimes it took eight Then there had to be a must to drive and to overy-day driver could headle

of about motal rings set conventrically located in the return air pipe to the fun



Crindian with a best of al

op the whole six "stitlens" will in There had to be species man in passage the extract blade, and that may ad to be proted of his job telests also in the whole world could



Forced circulation for the bet-ui-15 APR do as well—in fact, it would take two

do as well-du fact, it would take you well-any most to 60 ft at 81. In this year 1000, no man plan four clinkers does the whole thing. That is because it is made to defen a traction that year a slight because while the work the blade man tred to do in casy enough, for there has to be as ex-priparation for minish-due man who drives the modern acroper also drives the mector. The suspect of modifica-tions to which a well-known make of tracter has been just in a revelation firm in one equipped with broad replace tions for good traction and question of or outlor in a road swaper. The fire ward wheels have been subtracted (put unintentional) while the grantist incerand danch lever have been extended to the photocom on which the driver stands and stores, at the same time rabing and inverteg the screen blade. Here are one man and about three gallens of kern-way or "gas" per lone, Gelag what med

A Truck Tire That Breathes A NEW motor track tire designed as a punter of e-links operage. As the tire orner in majort with the may firspeciage gradually slow and as it pusses agets, and this breathing feature of the religior operates needs in instances The radial below form nes cuitag. coloring rather in street stone seems. The halve in the trend after free dispi west of reliev and were a coeffice perpoer similar to a radiator on a car.

The Abrasive Band Grinder TANDENG our be done on about to C wheels, lest markets produced in this number are not flat, no matter how great the districtor of the who the bend grander in the water, and the bend grander in fast, and it therefore griede to a true fast surface. Such a grander as the one Hustraned on this page has a belt from inches wide. In addition to the sandre gives the being a spring which tightness the idior there is a working table which is tru-This latter in five library wido This per at last wide than the land mits the band to be sooved at will from wide to wide, parting the part of the altrasive surface in the position decired for the work being done. The girnsless band fixed may be quietly champed while the relieve are in motion negative the the establishes of the never grit doored for the work in hand A marking of this wer in highly take olive is only metal working sloop, in fact In chart sty wert of skep uters as in angle of bree, bette, best rather, five, abundangs, collabeld, babelite, copper and steel. Delay a coree get a beautiful streight grain fision is sie failed, and other the work may be held shouly against the galde, the graft to



A MONG the auditable of mechanic designed to secure more efficient falcourse of the little games in the union MONG the multitude of investions solds eight, the our we liberter, is R. P. titires of Hobbertlie Obla server to possess elements of dictorion. It is not broke wife with an annotar riv back of the beered seet, and with process and perforance through which the gravitated particular some part of Nate to the collader. The investor calls his device a recurrence, and refers to its mark as the resulting of the fuel game. It to obvious that turbulence is increased by his design, and have refriest toposts that as the importance of that feature of manifold design. The impactor sixtures his device as resulting



value of apprial desires tended to impress cod



a wroop-up and mark-out ayar the old mechanical water-ein pump of the meterboal cooling The Propeller Pump A NYONE who has ree a meterbeat

water-cooling circulation ignores what a fruitful women of renting they can be cour. One finds one's self continuity looking over the side to see whether the intermittent jets of water that inch pump are still issuing from the discharge ofter. But in a late madel of a small -one of the kind you and riomp on the stern trunces of the ald Solder head-tilds not of freshie to lated by the fewertien of Ole Ech eneding water to ringuiste might be said to knowled the more key parts at all—quient and count for propeller and the boat. both of which were going answay long before the pump was on the job. In this meter, which he the product of a Milbelon is multiplized by a scoop and

The unider which is a part of this cared prest tell is not as college thin piece of sectal, but has sufficient thirkness to provide for two openingof chappens which are no evaluated in the rudder and rudder take that a come! charter would be seller the use to openings are just off





with air space between, that at better cantrol than same over indoor weether

parameter from both blokes of the wheel is utilized. The metion of the craft radiciality a convenience present, to print united over when the least in made fact to the . The water is formed up through a fabrum tren which the redder switch. Water is carried to the nater Jackeria of two "double appowed" rt II through certical takes asserted matery 50 inches in length. Part of flowe tubes are in a cell formation. solvick complice water to be discharged above the water time on that it is stellide to the operator. Enough presents is de-religied at high speed to lift the mater collectors are eath about two feet or less

A Typewriter, or a Toy? A MONG the carless inventions of the

is not seasoned over the brilliant One points this at the desired character whereagen is "Mayde respectables to chartes" (to space our information) o shift so that the letter at which the security flagge prints in housely directly over the point on the paper where the artife motion, the operation depreses the right-hand key at the front of the ma-ckine, and the letter prints. The hell

the of the "solventage," attroord to One of the "secretages serves a that one describing to added a hair release accuracy with the wide. The the last blac, and if one varient etyte its selection is assemble and a still letter, the general model targing fire, will fell late party and the letter in question will be residued general idea of carffective locality of



that works without keys

the meeting which one gets from this organism is expected when one loants Scales on this apparatus that on a typesay that the lifes of the ignorest be with our limit and penting his key with the whee, appears to our witness of ligans. It is with a wearwhat different take of a speed ranking up to 300 oluge. that the bitters are not arranged afficien the eights as then are on the universal typerather beylaund, we mapper had what redr this stationing too is supp to play in relieving the user from per-material classification in the rapids of

The Thermos-Bottle House OPERATING on the dealer wall pelo obje of a theman bottle, a Jose, California, literator has developed a new type of entered experience which fresh to have a larger at a comfertalist traspersature demptic version market confidence. The market was market of two writes offer with an air more letures, highed together by sizel cross-Published in dear with oblining main Inc Highters fines 2% to 4 leafest depetiting on the strength model, having topic-scal-grame edge. When these are laid as edgewise and greated toother with next conest they feen two eparate mentithic walls supply framed

trapeller by the crossiles. At earners of

recomes that the bullets were limite the

the house the units interiors in



the cools resucts strutgly for a short disand here to be lighted up by hand, with less of anymory. The ma-Study, forming a perfect ring, from end susterial in fed into the marking from left to right, the end being firmly gripped between the two controlly leasted rate through an exemptic least up the men side of the muchlar (the handle proje at the belt of the picture). At the bettons of the markins are two adjustable show which extend sumand between the The and several and the several and third, policies. These sides are according debed to fit the context of the sort. and they seed to galding and shaping her us it is drawn forward between the rolls. They have a slight adheston to take cure of any result varieties that may be desired in the digmeter of the ring to be firmed, to allow for the series of the metal, on. The marking is hand operated but out radiy is arranged for a belt drive. With hand operation, the exed of ring formation is along it to





viel reside estimate, for the savere of the death-wall neutrative provide in twen the emblés and make to employ Thirkness of the complete wall page male whatever is desired, and the fitlet of result is practically, a brase within a lump effectively insoluted from the ented-dware by the doublaic states within

Unique Powder Magazine to some the expense of a brick

Jerrey Zits Company life upon the simple lifes of mining apole state talking pile and during the parety therr. Accordingly then not a insured eight feet by for a distance of warraty feet little the day, while in this case brought the comp. which is this case heright the fave where it was recognizatively unable the shiftenine from founding to winter a section at heather had to be decised and the noticed rated by a safe use, of nearw. An electric beater was installed kn-t inside the spening of the regard and let all two constanted through a modes fate the character afters the chilar nite for an abelies. The temperature is noticely controlled by a thermoutal ristically operand legs which are not resided and inneght little expensite or the expecting positive autrestifully.

The investion enquires a week handle such in two artists, the lower of etters is rightly attached to a see rially depend metal handle frame and the upper photod to the front only the upper prising to the tent on thefred and capable of an apaneldow undersets. To the free end of the state excited is played a good gray will cureduc strongs a slot in the lower see reaction cast on lack widow of the loop and is pisated at its lower ende to the legs, which are pivoted on each side said upper section is unneratively com-

is not its writer use, it "house" on the

a males which controls the some eagle of of the loss. They when the loss is "Manding" on its legs (the upper section of the locality being then exceeded or 'igen'), in ren je Gebatife bemeet present description to another the destinant lower section, thereby firening a new maily complete hardle wilds being held in the hand, as when in arther use. This teneuest in the lamble is stood uple transmitted to the legs through the willing one, rausing said legs to result has expecting resident, when her has expecting resident, when they retain, sufficiently above the tankle surface on me to inheritor with the presiding operations. To met the into stoppy raising it by the under surface



street wetten thought from a

upon the legs now stap into say perfits position and are also us matically and securely locked there This allows the less to be shifted also -o its legs, if desired, without colle-However, when the iron is again token in hand to be used, the legs instantly recease their net-supporting position, as before. The rest can be built either on the fron field (as in the photographs), or as an attachment thereto, in which over 21 to both exitivity in explanation with a handle capable of attacherent by substituting it for the regular b

Rubber for Read-Surfaces

EXPERIMENTS are being carried out ty in the use of rother as a road surface through. The present test, ar-cording to the Shritish Trade Journal, in cording to the armine above consti-tle hardest to which the new solution has been put. The wintin is made from ours bark and wrop cubber. The north pure back and scrap rather. The north od of laying is similar to that employed with ter and asphalt preparation being bruted extil liquid, and sproud on the rood with become gravel is then sprinkled over the sale tion and a stress roller binds the two It is risked that though the cost of the ligald cutter is higher than iss, it is fested to last twice as long

Waterwheel or Dater?

A learned in the state of the pro-ter of a Springfield Man, manufacturer. This unique device has ten years on the wheel and is otherwise built to last atterfered on the side of the datar locks the alternest positively and accurately The many-arrand misers, of which there are four-presentiative for month. date digits and pror-ups of solid rather moided in one place. The dater person



The Heavens in July, 1924

The Amateur Observer and the Role Which He Can Play in the Science

By Professor Henry Norris Russell, Ph.D.

IN in this day of great conservatories and huge telescopes, the arminer activatories may make observations of personnel ecleritie value. If he is fortunate enough to person a telescoper-word a small onehe may, for example, observe the bright-ess of variable stars. The observable work which has sen done by the Association of Variable Star (Successes in this country, and by a similar equationtion in the in this country, and by a similar signalaction in Eng-land, has shready been described in these coissans. Or, if the telescope in a bit ligger, he may least for consta. This takes more patience; but if successful, as it is arm to be accuse or later in the hands of a conspectati

worker, secures him a personner; place in a competition iterature, for the occur will be known by the name of its discovery. its discoverer.

During the years of the war and just after, the number of cenets discovered full off seriously. Things appear to be inspecting now, but there is still "good institing" for supers wis cores to try in surious. For

resupie, lest autzeus d'Armet's periodis romet-which notures at intervals of about 6% years—was due, and for some picked up, quite attempededly, by Mr. Bred of Cape Town, who was leasing for courts without special reference to this one. Later it appeared that it had been seen a month earlier by Mr. Mellish in litters, who made a rough record of its position but did not, so Mr. Reed did, notify the world in time to set others

original with a time to set ourse earching for it.
Within the present sucrets a rabbigram but the Gratnal Bureau for Astronomical Triegrares, at Oxpenhagen, has announced the discovery of statler count, by "Reid to the seathern constriction Forms: As this region of the sky was then and is new nearly with of the min, and observice only from points in our weathern e-graphers, it is probable that the div whose pome has suffered a not improbable based of transmission. An orbit comnested for the present exceet indicates that It has already began to recode from the *13, and was preer less than 160 million seles from the latter, and even further from the worth. It may require in teles

cepte view for some time, but stands to chance of being complement. The Amateur and Note But even the man without any teles at all can be of real use to wisher. For inputers. Except in the rare includes when a parteur is caught by accident in were part of its path, by the astronouser's conero, we sent rely extinely upon visual

expension: and, after a resonable spread of practice, it is possible to make up good expense of practice, it is present to make up give, records of these fugitive sparks of light, drawing their tracks in upon clusts prepared in advange, in their ourone arrest the stars, while the impressive is fresh in the memory.

A single observer can make excellent records of the A stagle observer cut make excellent records of limitative of necessar sees are heart, their invited, and when advisors sees are busy, their invited, and when advisors occur the petit frost which these tracks seen in relation-frost which abservation the real orbit can be extended which was followed by the memory before they solved out attemption. If two observers, as few sittle apart, were to make such accordance to the sittle apart, were to make such a description of the same hours, neverthing the those at which the tenteres supported, they would probably source a greetly matcher of "Goobly observed" meteres, for each of which

maske of "feelily sharings" mattern, the cache of rollect the distance them be characters and the highly about the sarch's norther could be excitative—string valistic gazeridae, not observed accountly, but the extra-tion of the sarching of the sastern would be still seave valishing, as it sufficiently accurate, it would till save valishing, as it sufficiently accurate, it would be sufficiently as the sufficient of the sastern would be sufficiently as the sufficient of the sastern would be sufficiently as the sufficient accurate to the sastern of the same sufficient to be sufficiently accurate, it is sufficiently as the sufficient sufficient of the same sufficient of the same of the same sufficient and the same sufficient and the same of are spins as the same sufficient and the states of an explain the same sufficient and the states of an explain the same sufficient same sufficient and the same sufficient same su

uties of a second is not over. The late Professor Young-one of the optobacking figures of the entire properties of astronomers—bid the writer view that whereer he mix a nation, he began anylog, and/o North had a little hand, the fewer was while as other and appropriate Marie went, the lattle was more to an To repeat that Nit of degreed at his accustored speed took him the seconds, as determined in practice before It had to be Morie to that the syllation shreld an above smile statist! Chalcours on it woulds this simple scheme affords an envelop awars of tied a small laternal-servided cartirount does not alter the ver's rate of speaking!

Another Instance SCII spetter example of the utility of arrest estimates in fund in an interesting paper recently published by Mr. Willard Fisher, upon the brightness of the totally evilpsed most. It is known to encryme

neglect the present text) still is case to see

4.15 91 240 E. NIGHT SET. HILY AND ADDREST

toon while the latter is plunged in the sectile shadow comes from the star, backing been best into the shadow by refers this in the cartile almosphere. The chance the air shove that part of the swell where the tays pass, the mary light will result the meet, and the brigher it will appear. From a study of the reof 68 latar ediper between 1800 and the present, Mr. Fight confine the estable provincels expressed in different investigations, to the effect that for a year or two after great valencie organics. The that of Kaltoni in 2011—the eclipsed meen is upostelly dark, decisions because the owner atmosphere is how with tolerally But in strapected discovery is that the ordina part is, in the savings, a great deal darker when those note that much it have supped over the profess, make the center of the shader, so that the sun's rays has passed over the south pole. The only obvious regulates upper air is the Aprile regime to exce charged by apper are in the Arter regards is more concepts to deads and have then in the Anteretic. It may be some tite belier ur beie Gret weither reperis sofficien

or to medien or to disserve this continuation The descriptions on which Mr. Phone insees his estimates of the brightness of the oritized moon were of the roughed seri, and further observations, made with all modifie cure, model by valuable The Boarens

Turning to our sempelected stow of the sides, we find Very citrest covrises. Well down in the west is Are-Street, with Corons and Hercales above. Regular and Spins our term willing up to give the plant, Natura, Social and Sagitlarius shine in the worth, Juplier blaze, in the worthward, and Mary low in the worthward. Pegrers is low in the end, and Consispela in the nor cent. Dres Milter and Proce are high in the north-

Ures Major is sinking in the northw

The Please Mercury is in contample with the sun on the feb. undrie invisitie until the latter part of the mouth, when Vetres is also in contraction with the see on the 14, and even reopposite as a

morning star, becoming very complements in the days, on she has been in the days. Fir rises at 2 30 A. M. on the Stat. Nurs is approaching opposition, and growing larger and leighter day by day. By the end of the taught he is onto 25 tallies miles away, and is brighter than Jupiter at his best; so that those astroncores who specialize in planetary obse tions will be book at work on bire. Normal med recoglition but conspirates Scripts past opposition to temperature -through very for earth, and he remainin earth until about 2 A. M. In the middle
of the month. Soturn is in Virgo and come his qualitature with the sun on the 18th, he which ther by may be called un evening star, as he arts before midnigh United to the fireders of Augustus and Pivers and crosses the neritian at 3.54 A. M. on the 15th. Nepture is in

The most in July
The most is new at I A. M. on the 2nd.
In her first quarter at 5 P. M. on the 8th. full at 7 A 31 on the 19th, is let led at T.A. 31 on the 19th, in her leet for at mon on the 20th, and new again the 20th Perfact the names are possessed in Newscript and Vernas on the 1st, Nep-lance on the 1st, Nep-lance on the 1st, Neplan on the 10th Justier on the 13th, Mary on the 19th France on the 29th, and Verse again on the 29th Nice of these outputches is tertification of these outputches in

Les but too aren'the sun to be observed of our fine in July

A partial religion of the sun recture on the Stel, but is of little Importures, being observable only in the extreme portlen of South Africa (just at surset), in the sem occur, and on the America continues.

Mensurational Characteristics of Photographic Districtive tipe pay only continuously to

I could come into me in whentile investigation, insiding it necessary in study the properties of the firm as early to insure that its peculiarities be not projected in the interligator's print ment the extrict matter The observation of Cheskies and of Curtis, that plus tographic film is subject to large and irrevoke con the is disciplined, to negligible up, in the core of near-curing first. For motion picture, nortal, per trail, and process first, the contractions and irregular the are found to be expellently been length and which are different, the length of a fine absuling increased effect, the probably to strains in the Files of all kinds are subject to parallel charger in height from day to day and from winter to suscere, day to handfly conditions. There is to local class the to portrolf film or in methos pirture and arris discretions of 10 interests exceptions appear in NC titre on descriptorest, which, beneate, gradually of the a rew carps. A fact at washing to continuous to flow to the Astronomical Journal for Arcil, 1904

What Happens in the Lime Cycle?

to literature. It or-care in the cattle in various forces and in such for different nations, according to to properties that it pressure, which are dependent proviy on its physical make-up. Chemically. all these forms are fundamentally the same. This one variety of Streetings is used for hallding purposes, such tring of thomas is deed for enterly is known as an indicate linewister. Arother contry is known as markle and in employed in a big grade conformations. Still another, from a contra parts of itsely, is known as Carrers routhly and is employed in making the free kind of statuery

But the most imperiant of all imperious from the commercial standards is the commen markety which is counted for the purpose of heigr espected into line, then to be used for a great variety of purposes simple. which one of the most meful and coset significant is in making meeter, planter and the like for building strucof all were. However had a greated to and saiged with convent rock and then bered life to give center. The purpose of incorporating the literature with the countries, in the same that leads the helider to me it in making meeter and that It can be made to give up one of the com-

expensive, extractors, which our tien he related with

water and sand and made but a plack upon on encourage to the air, taken to again the expell that the -rightal Execution lot and is converted into place. This is known as the line spoke and is the fundamental pelaciple on which building emotracion rpetata. Thus the original dissentate is bornt in a little All

Any assistant that it may contain in Green off and evertually it is development into quicklines and cultimate evid gas, Quicklines is a promiser substance within union with water to give milk of time, a substance which uses how medidant men. When the planteers reals to picture, a familiar sight in front of a buildterms no present a memory sign in tree, or a successive under course of examination, the steam which is evolved from the militar principle of articleline and water to due to the heat generated in the formation of adial of line. After sort is mixed with the line, morter is obtained the heritages uses the meeter to set us a jetst be-tween the bricks that he uses in beliffing up the wall. At first the meeter in part and plantle so that it can

below that it holds repetate. The same planement that place who place is used to one did nough brief or exclude marker of an ex-ceptable of the solid of the solid marker of the placer with the ordered and gas in the sit. The variety of the control of the solid control of the placer with the ordered and gas in the sit. The variety of the control of the solid control of the Societies placerors are sent to hold it in the right in Societies placerors are sent to hold in the right in the case the placeror are sent to hold in the right in the case the placeror are sent to high or for his half or case the placeror are sent or high property of the case place in the case of the placeror of the solid particles.

and goe for combination with the line.
When recent is proped into modes and allowed to so or harden, the action that takes place is exactly the same. The lines cycle is being completed in this case in wall as in the case of ordinary places or growth Thus, the carbon dividle which was originally a part of Thus, the carbon divadies which was originally a part of the linearest relind from the certifs, and which was liberated and allowed to except these that destruct the process of herming litter, its coursed again to examing the set of the linear tenth linear to give linearisten. This is the hard subserced that from when excent or a contract series. The time of secting is also important and can be contralled by the addition of the varieties substance to the context.

very hard and lovery, which destures are edjectionable for make reason, let since rendering them until for the except for o-claim uninquentally purposes. The math reason for tunning hides and skins and excepting them. into leather is to prevent them from spelling and period-ing as earlier, but at the same time retain them set

and firelity remark to be coulde to various wars The nature of the tenning process varies greatly and the variation therein piless the manufacture of modthrested leathers as sole leather, light kid, etc. But it sout not be thought that the tenning operation is the only furfor which controls the properties of the ficialty product. The finish that is given to the leather the depression the character of the same better, such butter, exampl better, give bettler, etc., depend on the after-treatment to much as on the

The skin of hide is cresposed of the harry. The tenlayer in known as the epidermic or cuttie, and the bottom layer or derma, also called the true olds. In staking leather the epidernic in completely resaming realise the equation is resignately returned before the certail mostling execution is reached. Hence

HE REXISS OF Makes of What Happens When Leather Is Tanned?

What the Happens When Leather Is Tanned?

All designer better to be all designer better to said from the tree with only, with it common and particular factors to be took, all designer better to be the factor of the said state post principle of Boson material.

When the value of defect that process. term, and crows. An element tentage and, and that is the active principle which contines with the expende matter of the hide to entwert it into the autoentu-we know as lattime. The registable tenting process gives sale leadings, inchesy for appears, harmon leather

up the lie. The main dissidualings with the process is the time taken in its completion. Christo tataing in a comparatively new process and is rimnical in neitre. A christorie-a sait of the metal in riskerial in means. A commenture was a serious or representation is employed in the process. It is much series reprint them the vegetable tunning method and its gives a leader which in some resistant to water that the eclinity bark-taxmed leader. In this case the chemical couldines with the putraschie matter in the bloks and consume it into a number received from Leather in also taxted by mean of the count feather in also taxted by mean of the count feather alon. This method is used for making with

posing. This process is employed for magnificture of charsels, buff and back leather. In connection with the tunning of leather it is in

meting to note that there is a number fallery curve that the renor way shore pinch when feet were in the fact that the leather exchains bunch or lique. one max that the senter contains pours of ages, there is no like in leather and it is unreservable to acrelle this action to names. It has been assigned to the ab-aception of medicate from the feet which thickness the leather and shritten the opening for the foot.

menture and authors the operant for the your Beweith; as interesting desciopes in it is maxing process has taken place with respect to the abstracting of the line it index to ten the leather. This has been done by Invoking the aid of electricity. The electric cutrent is used to cause the san Hayors better and more rapidly to penetrate late the hide structure. A current is passed through the tun both while the hide is to mound in it, and the electrolitic action of electricity of meeted in it, and the electrolitic action of electricity of the tanch subplies permits the latter to work he way into the fine capillary pussigns of the hide reach more quickly and spore effectively than when the hides are simple sealed in the lausting both an inverteders.

salvine whose such increding is four First as a present electron from grass or owned plants, the principal consilirate of which is starch. Number to a state of couples, electronic North is a ware scholary of entires, exempts make up, which is absolutely independible in the new state, but which is closely allful to the more dige-take substance, desirin and super. The pulse-pail fred want, for which is covery after to the more digestore extension, desired and segar. The pulsoopal fired value of level or rule fire is the stand that it was also, and when this starck is changed by lasking late the shough which convert it life to printers wager. destroes, which is absorbed by the bland current and used so a fact in the matter processes that go on in

r amman system. The sole purpose of holding or, therefore to combine the star-by constituents the others are offered as saids at the flow, disputable. Everyone knows that there are contain profinition steps that are taken there are contain profitables stope that are taken before the fired is based. In the first place the dough its made. This process consists at taking negative is made. This process consists at acting together various togethers which are containly emphased in malding a bread fatch. These ment-duck me their, water, york, tolk, sagat, till, powder, and or em-neral fit, mult extract and perhan-offerent elements. example the ability to recently proposely fresh must respectively long periods of there is a nestern ladary, the mining execution is performant in machiners, after which the dough is not into bond pure and allowed to provide for a possible beauty of the the time the first chemical change tak place and the death rive. That this is an inquirent mating will be restified to by everyone who has eaten

What Happens in the Baking of Bread?

In the butter of written falls of the state of the first of the property and was severe different points. Thus it make the work that the state of the first of the details are wanted. bread or note that did not rise properly and was presentially "bency as lead." The artise of the yeard in in industry the frequentation of the despt. This is precupated by the generation of gas which pells up the dough and cases it to "rise," or, to other weeds, in iterages in values. The gas that is ensued in cartesia Heregor is values. The gas that is exceed in cumular artid pas, the sense gas that is used in the manufacture of sods outer and self-drinks. There are unusual living organisms present in the four which also have some influence on the action of the yeard in receiping the local to the: and the character of the four and of the yeard that are salved together must be taken into sole-sidenation if a bread of proper quality in to be obtained After the deigh has rives, it is ready to be based. The beneated death, as it is investment late the later over, contains imprisoned entitle seld per. The heat of the own has for its first effect the reputation of title of the ones has far its tire effect one exposures on any gar and the facility larmore in the site of the half of ferend. When a site of bread is out from the half, the form founds to stop presented the monagent of the heles becapit to tied byconeti the measurest of it replaces soin gas that was imprimed in the degree. Do lest of the own capes the out-life of the lest from a crost, which is expressed of destrip and a rectain maken of estamethed signs. This hard con-ing over the had of bread presents the sauge of the beyonered gas within the best and union it possible to which is "built" minimals, easily discover breed,

The lend has also bened the starth office and room them has a dignetible form. It must be mustered that during the fermentation powers certain constituents of the fiver, known as stropped, even labor action to break down the standar and determine constituents of the fiver and bring them

secure distress results. Into the little visions break or rolls, the bread is washed with a solution of earth introduction of the looking to give the bread a giveny crust. Eye breads are raise from yet force, which should from specially prepared when Bour, whole when hered from specially prepared when Bour, whole when tens the state take, and so to In holder cule and party, year is not employed, but halter poster is edded to the death solution. Endo the effect of less, the baking product is decomposed and generates certainly acid gas which causes the dough to the and give a property baked cake.

Chinese Hair-Net Industry THE infrared business in China has bad quite a big

I buy. It was established vigations up corrects who imported the sets from Chefto this decreasity and then expected them to the United States as Exceptionable bair sets. There is atill exted-cettle expect of leanest bair sets free Chiles to Recopusa countries. houses held not true CARDA to MARROGERS construed When direct trade is bottom-bein rade was taken up with China, henre quantities of imperies, undersized and principle park held were experied. This finally resulted in the weball-bestock is Chefon and Telena, by resulted in the establishment in Chefon and Thinas, by the foreign and a few larger Chinese raporters, as abstract impection functions, near recipitally as many as 1000 operations where hathant campets are imported and, if accessing, the min required before being ashipped. The me-making land is a home or "retting" industry, the hair is distributed arread in the various of-The non-country meet is a hole or "retting" industry. the hair is distributed arround in the various viting-in the historical of Chefon and in the region of the Shenium; Ballesy—and the zets uscally one through the hands of second Chinese middleson before they are

Physiciogy of Am N n recent number of the Journal of the Ma Biological Association (British) Mr. C. F. A. Pu A Biological Association (Brittins) Mr. C. F. & Pancial Geocures the physicalogy of association are ob-served in next success of the Binax type. The author flash five tills organizer can be looked upon an a contracting tribe of gridatel eventions closed at the particle of II, be associate and in overgland by the finish cutodoms of the advancing pseudopolitus. The final originates of the advancing tills to the frees a configuration of the advancing tills to the frees a configuration of the advancing tills to the frees a colopium stream forward through the tube from a plous of lingeriacion within the posterier and or the Amoths. On reaching the anterior out, the streaming studeptions approvedly from the fluid over-plasm of the electromic pseudopodame. The fluid over-plasm addit continuously to the conferentiar this by golumns are the sides of the pseudopodame. Mr. Postilis beings from all sites of the pseud-podius. Mr. Penrin leings ferward evidence in ficure of the view that the aveiling and on of the anterior ectopiases in day to the retice of an acid, and that on reserval of the acid

ed water is last and the ectoplasm contracts, This contraction ledge to peak the pseudopodium for-ward. This indicates that asserted measurest name have a fundamental statisticity to convenie contractive said citizen secretary. So far as Mr. Parille law inwettgated the relationship of associate managers the properties of the nedlers, he has found it to be purallet to that of other forms of contraction. acid needs. Attender tellimetry come to move, but the loss of monogent is entirely removed on raising the alkolitity of the medium. Experiments with water of varying empete pressure show that purrenter is only what the water content of the sell lies within

ortale Health,-Atlanted from Notare for Feb. 2, 1924. Self-Igniting Water Lights MAN overleard?" A series situation at any rise tel seperiody so when the accident happens at picks. In the first block a loave must be though to the

befurete victies to that he can keen afour until the ship is sisped and brought back to resour him. In the second place, those on beard the skip arant be able to find the sun when they return. Erry rate in ipped with ring bears which will knee a man affect In the water. In order that they may not lose their suchabors at hight, the Nivershoet Supervise Service lights. These lights emist of a regar cylinder on talling calcium rathles and calcium tomation. The

cylinder is air and water tight had her a plug which from the ship. When water flowing in through one of the two loves thus opened. strikes the carbids, arety lette and in concentral which escapes in a stream

through the other bule in the top of the cylinder. When the existence obcaphide becames wet a small fame in produced which ig-tites the stress; of acety-

inte. The man who has fallen men the light which has no injunity of 150 cur. He raine traced it, fact

Laboratory test of the new water lights which ignite and cast their powerful rare upon centact with water

the base, and is exposited until the able has externed There is nearly time for the since the light continues to burn for a period of 45 minutes. It shows within a



Ponder begos of controls which reduces danger in

e it strikes the water and religates to distriy if the fame is put out by being submerged Our photograph shows ben of these lights in open-tion in a histograph seet. The interment in the for-

because to believ raceuse

A Vacuum Cleaner for the City Streets A NONG other pertises which here invention takes a rest long in the usefunited executing of the Most large cities have time and again experi neated with revises types of includent awapers, on, to give them up in favor of the good object-local brown and leaves method, NIII, a few travillations sweepers have stood the artid test of practical use said

The latest thing to mechanical street secondar is the interesting earlies shown in the amoraganing view Storresting encision shown in the newagagating view, which is two being used by the Store (Chanling In-partment of New York Chy, after completing a weeks of nearwestal trials. This mechans is persisted with a power-defent brash at the rows, which sweeps the street passenest and drives the dast into a power-

fel surfee streets which in turn delivery the dask to a number of certain ers. After the cuttainers are filled, they are removed from the marbits and placed on the side walk for collection to the west sugges or no for tracks of the Depart-

When the Tructer Turns Street Sweeper Duning the part will elite tractic, for which ben frend war present late service as a et, eldevalle, track chine lifes, this time an attach 42d spire revenir, all lo

Small served rell-Vays last fitted the trector outfit for less exp servete than the treat electric surrectory, and where there are lang stantoles of little need stre post the tracker to clear a noth through space. Less white a fire Makes stre fallens used this trucket sweeper streetfilly to

> The tractor, which is where it the profession lac ties, is estipped with a spir upd stord fourth It makes a highly effected precised and contracted riestite sort it will handle store for to two Inches dept tooking a risea envised bysiss for a

listing drives (liver for workley should be saids whose of the executor, it ran in

A Punder House Constructed of Concrete A POWDER house used by a 1'tch mining exquests by per that should un exploded over in It the structure eveld distangues tasteed of suffrag through the air to light on some neighbor's hom. No herp appropries ages on were neighbor's horn. No here appropries were used in the concrete, so that desings in case of an explosion would be reduced to a substance. The herehas the slape of a corpora, which allows for the least possible ground of relationscents, while the reci

is covered with a compaction reported. rade of overrees Some Forces in Social Evolution If three prisery mertices will prevenuation, autri

Till time protection, man previous to control with all the leaver attends. Without these improtective with all the many clinics. Appears new imposes to form of the could propertied to kind; they must have have been present at the appearance of life none reach. These largelines were present in the protection, judy disk and works. When the parents institut, the next of the ent aveial forms to be emitted. Sent reads 110



larger scale than its household in this latest street-cleaning made ild protetype.

It was without week deale present in the higher flat of the middle Mesons. and six in the restles

the

and also in the re some time, for it is pers ent in those forms of tions types which have serviced to the temperal r exuaçõe, maty fab. such as the statish, are vicium is the protection Later in time there developed attention some maximals an association indicidants for betternest of their troection, food-apply and

this proclation into her er recent version of the street-cleaning maand parks certain undient for the g ficulties in the behavior tractor that keeps the rails free of store of the individuals must naturally take There would develop for example, a susceptibility to instending, after these individuals that folled to respect quickly would be knied off by the constrores and than

have no offereing sibularly one decided ariginality would be obliterated, since it would tend to expose not only the individual but the entire herd to All menters of the herd would thus develop the same fixed mental tracibles to all sedimery keep by tracky clear of These special reactions would be impressed upon sur media; primitive of adjuster and earlier

numeric through the encountry survival of the B dividuals exhibiting them. Today, through natural h belitable, we find these largered upon men's body. In and we receptive the kent invited in many charateristic two liets. Thus decided engineets in emblaci is looked upon with suggicion. What the majority may or do is right. Each mell-things have food these; that is, his mental reactions are precessed by what those ind tideals with whom he man provides say is proper. The herd is the individual's meant environment, as that he is fourful of welltude, physical or neutral. redight, he is repartably specified to bedership. the is subject to the presions of the park. Indeed, he is more wantities to the value of the heal than to any other influence, it can inhibit or etimolate conduct, owner, mary, estimate In obtain to the gradual expension of reta

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Recently Patented Inventions

WHAT IS A TRADEMARK?

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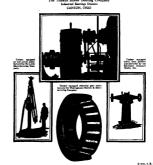
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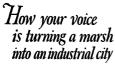
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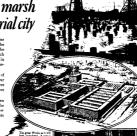
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government; modern street lighting system; parks, golf course, tenns courts boulevands; a post office, less than a year old, advanced from fourth to second class; subsurban garden hands opened and being settled. Such is Lonevee adapt:

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3	north and south, first meets the famed Columb
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- 1	-the Northern Pacific, the Union Pacific and t
-1	Great Northern-see at its door, pleasure steam
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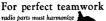
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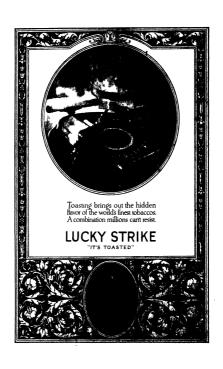
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this further; best seeds's will being I clumps of this investigation to view of the nature of what her pure before, we will be giving anibing own when we predid that this proof oult be not proved unforcested, but will noticelly carry a cut-general denial that the belowtons to arthes" upon which the whole Alexand simultane resis have any obleville cale

This will bring "Our Alexans Investigation of the what we recard as a highly wave-eful end. We used into it inoing ment to the electronic system, buying that we might that it to be a trajer develop tent of templath contact sorses, ful personal for the proposity of heralities in to the world as such. When we find that the facts lead to merely to an exposure of the greatest starle time of covariant simple in the block of andrine, how ever, we feel that our service to the comsensity in so reporting to as large as though the entropy had been that which a prior, was the mate to be desired

THE respectfully successful flights of the "Shemarfink" which we have no

tired in the past, the furtherning flight across the Atlantic b. the "ZiLHI" to which we give space in the process to see all this has aroused great interest and conflict of spinion with regard to the perwhileter of the glott rigid dirigities. Die products above next be given to the question "Any alrelian and proof." cal?" before these costs can be seriously considered for consucrely) two certation nimer Almando Kleado of Nrs. York Paleersity, who is known to our peaker timegi, his restributions in the errotest tiral side, has put in our large a write of three attires it which the winds peop less is constally analyzed, its components lectated and discovery, and a constante reached. Professor Kirnels steple with the safety of the alpship while in the air, the problems of healthy and mostly and localty, the withstated ricescule of air-Silp design in their learning spen all tide of the presented and apply from that of go been and go expely, the item of Is a word, he gives the whole subject report from him. His conclusion visits we don't tell on till page correlator to the lane expect on hard on the Abrones matter, we shall be you walt for a sight of Professor Kiruda's tand until he sless it to bot knowl! This write will start in a net cash bear-anields that of September and oull run along to an early a cilium are the designed of more printed festions up-6 our space penal Mint, Reserve For of Day Metolich-ternative (States 4 M. Mall. Phill. New York Separate

to seen with a corresponding the exof the expedition should have been killed Ped of Civil Proglams Surph FLD, Ped of Sa Delensity In an arrespt to company that fulfilled of Research The arte corresponding to the ex-The percusardicinal is a is, of come, professional whether all other expedition will be embryoned to exp leich Malber and A C India were the nessbors at the Mt. Econ-1 expeditive where doubts in the attempt are non-

The estropolitary that Just as we go

FEDERAL INTRODUCES

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THE MONTHLY JOURNAL OF PRACTICAL INFORMATION

NEW YORK, AUGUST, 1924

On the Road

Suggestions for Lightening the Motor Tourist's Contact With the Traffic Problem and Other Puzzles

By J. Makoim Bord



5-181 - 12.

I'll the county of sunsper, the question is, as it has always level, "Where to go!" Most of us our propositer the time when redeficient of this perential protion opened with an exercise among the milread offices, devoted to the reflecting literature. Ultimately one recurred to the ticket office and in early one of those extraordinary partitions their

that opened and shot like an uccording, includention care is a wife last-addate struggle with trenks that weekled size and expression was negligit will, back neg and perion-the specier of the cleck always in the background, renemebody fiching away the precious nitures that interresed before the departure of the train. departure of the train.

The question "Where to go?" is still with us, but the atmosphere sur-renging its considerable is closinged. In place of the railroad's agaradjectiviel literature we have the studied, tabalar reacisences of the How Book. That thing on the table that looks like the relescopic railroad ricket of bygate years is in fact a feed mate. The problem of leaguing in still with us. that we den't have to wife with resoldings trustees the lest substy, became there halt any hat mixty; and we are supposed indifferent to backnon and parties For we provide our own transports

tion; and, in gay constripation from the coincid schedule, if we are not at 0.66 We delay our start un-60 9:20, or 11:10, or any intermediate that saits our convenience If we have distributed the strings away problems of 1900, however, we have terreduced new otes in their And in 1900 we did all our strugging beforehead; after we get of the train everything was up to the conductor. But today we carry our problems on the read with us, and get clear of them only when we get rafely home again. The difference between a reconstal four and an un-raccostal one lies almost entirely in the degree to which we have spiled twied their cropping out and poweled in adopte for their solution. The people who take to the read

full oberply into two groups. The tornibers of one are treather in every when-they are living in their own for a period, staying in one place only long energi to see what is to be seen, then speciage on. The other group moving on. The other group is of people who are using their merely as a substitute for the

train. A varieties upot has been wireled, and it can be racted in from one to four days of detring. No detring It is, rather than authorisity the suffered is, rather than patrociates the officers. In rathe of the gap between their intentions, the people in these groups have covering peoblesis of deciding where they want to go is one that I shan't event here, note in a very potentil ear, by laying dent a few simple words of atthe and outside. The laying

Near of to any easy drivers; was are not to one long drivers, able to sikk at the wheel all day and far into the night, and the h, others again step to street the logs and refresh the inner man at frequest internals will others me through for the day at 100 miles. The many remarks apply to passempte and don't furget that the next durable driver terrially frugile mesenger, or one orrest. The one of there is, dog't blir off party than ton our olders. thing more pathetic than a thereughly send-word driver

is a theroughly ent-left powerger on IAn't crabark a bilistering but day as drawn in passenger, upon a trip of race than the days without some experience belond any tellevilled here tt room on beets lite per ster without a sensel service who ene drive, it a pinch. And dea't make up a fouring party of propin half of sector the read with out under the wheels and the adventor red up the solies, while the others regard a tear as a number of rengine ton white, and stopping built un beer to pick flow and train phriums. If all year party name to the the

it down't matter much whether you take this, that or the edity kind of tour, and I am not poing to try to prescribe tor you here. Hat there are n few princial negative about roads and roades which regist to be under and reales which eaght to be under if you plan to drive access the newlitery separating the Bocky Moun-tains from the Porife Court, you dentifies kind in physics that you will strike a lot of very heigh driv-ing. But I would urge the adulwas west of Sall Lake, or any other te mixing you serves littab to No an the several national eletaries of ellipsete and acceptable, will of three suffer at 160- ther from way bed real resilies, which will be ween before they are better; it is each desirtal whether they will extran be presented for the average driver There is a regte through New Mexico and Arinna, pre-units; better drivopportunity to see the Grazel Conven as well as to take in the livekie, to say desired extent in soft trips be-fore leaving (telemate. There are also region through the postlessed that are

for begin in climate and geography and at their worst no name different

for the driver, than the latter adverthed one further write-awareing



part districted interface here, there are money throughfore. All the relation of herital been read that the desirable attents around the none out accurate scene of adapt, and around traffic offices. In addition is producted distriction for each office are required to product distriction for the second production and product parties, balls itself where they have form the greated than from the six which who should, official through this described for the first term, of worldling trains! Colombus Circleman eigh of leteraction in the heart of New York's beaving



my pages out of the modern detact engineer's rote

for was to tell like that you rould drive from Bar

In no other section of the country is the differen there its less rouse and the record-less as wedge. A very good thing to modd in the Lincoln Highway between Hitchurch and East Liverpool, (Sile, what part of this re not rough cits streets is had diet rough through the Little White these conditions records, the Herego the latte. With these constitutes reports, the lowi any one from through is the Obschund, Buffalo 48d Alberts, and from 81 Louis, via Columbus, Wheel lag and the Marchand mountains. If you have reposited in drive loss from how both the Rocks, as through librafeet and Springhild notice than New Leading and Perrisbers and If you so have Mades she'd hope for mainted good must an above except along the major court Midreus through Portland to Burney, Bessel three less than the choice of numer is a hepty a matter of trapeaus conditions of weather and two over that no lenguage while is possible.

As a percul proposition, design south of the Ottowell) are so led that when a long one exists, any posts awiding it is likely to be the best choice. If was are placeter a trip that notice this tenuric applicable, ex-per; local nature is your only submitted; I shall come, further on to the specifies of how to get It US med statebard home one finds to difference to lowering the right room. Defining from Haffight to New Fort, for the part than several years back, I was whally

eat Streamer or maps, were one of Buffele Ineld Tel I completed the Jentiley willhand a single wrong burning, and with only three appealants underlying of which were dur to bestween paul conditions, timbe or twice that I have to stop to suggest the signs and markers they were built to be road on the fig. time cut do no well ever an inment- annier of abort interstate and latra state rection and on anternas mused ried highway of greater length, of which the Uncle is lest the obtain and had broom

When one's History leaves the surface Aprile, our proof refs upon a bullelone combination of maps, questions, and com-try finger-posts. The recipe motion only if the ingredients are nived in the connect projections also, it is necessar, that the sol the restable informer biased prop last verment I not up unersma alternat

to drive evelocited by map. The com-was burder New Haghand, for the first time, like pair extended from New York. to Montreal and Uniffee, all on a sheet which, employed unfolded, could be which, completely unfolded, could be spread to mark know. The trade made were inflated by red likewise walls that great have been at least 20 miles wise. Of course there could be its allesses to or course there could be no missing in-show more them starting and breaking points, with the larger towns on much. The wirths was trying to get, from the flatter to Prospect Ferry—a complicated ren of some 40 miles, with dissectorresettes breettens. All bile term was good ther was to but some that you reason grove from the Harine to Prinquet Freny. He had been through not days of stailar different, all over Melao, New Hanny white and Vernett; he hadn't yet discovered where the There are many whose water is large except and whose execution is detailed enough to show all the heads. On each a map, the line that represents your

alle. On white a many, the time than the comments of the real as it utilitie before your eye. Each crowing, junction or preschant rurn is proved and recognizable. so that you can follow the chart through our and know at all times gravity where you are. Then then are major whose weals to not large enough for this, or these execution is not detailed executof the eligiblest value other than as a list of the brackthrough which you are to puse; and it would be more converted to draw up such a fire in tabular form, broding at bome the builder map with its annioging There is no middle ground: the map that gives the slape of the road, yes can drive by; the map that FUE CHE'L For clear responsability of modelstors, the best

maps are three of the United States Geological Series. Yes can get, free, free the Lifecture of the Sarray, Index same of size States in which you are interested showing what are times of these States six reserved in when seems. They had never those supply by secribe titler, at els cettis aplier in quatrities of 36 or more Too will get them alway 10 days after you said you only . so if you want then, write for the index maps a month before year true starts There makes are large, and they come to you fiel. If

you field there, you treet give there fields each way to price than the a resemble size; and this makes then awkened to table on the real. It is also difficult to cery then in such way that, on running off the edge of one worker, our out at once their my the adjustment

section. And they make to distinction between good The emiret map to handle while the car is in metion

The ensure upp to nance while the cut is it motion is that yet set by the Michella people. Though it is a fielded map, any part of it is exposed to the eye by opening the fielder like a look; and the tagentous ar-magnesist that makes this possible give presents the wind from physics or much haver as it does with the started, and so far covers only a limited area adjoining the Atlettic sentenced. Though the sair is much the Allettic respect. Though the drawing is no studier than the prohipted elects, the drawing is no clearly done as to give full deleng butto-tions at all junctions where the surface of both roads is fair-tile pool to have one in any dept.

The sectional roads in the Blue Books for the on both roads is suf-

part of the eventry are of great value. Copied from latter though an a scatter scale; and they distinguish between good, fair and poor roads. But they are not revised often enough; a multimobility this distinction is selding of much value when none than two or three pears old. Nonemen felded tupe, covering contiles, regards absent large ction, etc., etc., are published by surface firms; but they are seldou if ever any more un to date than those in the Blac Book, and the latter have the adventage that they can be handagree with the primet new cut or man-versaci in agree with the primet new, which apparently is done over every year. By procedure in strange certifiery in to comy little levels and, when they evilet, Goldsgird Sgreey maps. I have then us intollible pages of localing nywif at all times; plus a means for knowing what reads were once the preferred ones.

But there exter these wires, in spite of everything, you will have to usk your way of people you used along the road. New I suppose you working drive of the factly at Jersey City, and set the traffic cop the way to San Prancisco. But my Bar Burber. to San Principe. But my Bar Harbor accomplishes that are under circumstances.

that did not reveal me as a monoriet, and he asked me the way to Destro—a cold 300 naive newn. And I have heard a tenrist on remarky reads in the kills of exports Oblo nek a firmer for Chicago?

What you must have to need doing this seet of thing is something already mentioned—a list of the towns through which you expect to drive. I could mus-tiply examples out of my own experience. day examples out of my own experience, and appear to either the point that when and appear to either the point that when any out know the next time by mine, yet can always got directed to be; and when you don't, you meanly are quite contribution of the covincy to porary vossible beforears any lides at all of where you want to go. But the thing is no shedway, once if its potential out, that I shall save the space which the annual new model take you.

Even if you about one the space which the examples would take up.

Even if you about or make someholy who could give you directions covering the next to miles, don't let him do it.

Take from him only what you are even

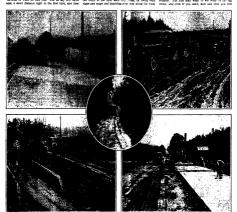


A receic spot on the Lack hunter, N. Y., with Security

you will be able to remember; when this rame out, and again. If you try to take over information to bigger thick, you will find that the other below's libes, and yours, do not agree as to which junctions are parallag and which are not. Two will also food that, it there are due to your party, and if you for jove informant that you should not have been comen, two minutions after you leave that you will have examply forvervious of which to find you. Will be may for-mile

you you. What these professors don't know, they can trey pating by an when you can that. They are trey pating to give you because it can that product you've process to characters of Conserve, where there is reflets a lotted yours according with a men final of very precible data about reach day many patine. Let not you rear much is new parents dury saming patine. Let you five much is new parents dury through of the many parents of the parent the reach of the Text state of the patine, by policy and the reach of the Text state day that, the sky policy are the reach of the Text state day the sky policy are the reach of the Text state day the sky policy are the reach of the Text state day the sky policy and the reach of the Text state day the sky policy and the reach of the Text state day the sky policy and the reach of the Text state day the sky policy and the text state of the sky policy trees trees the sky policy trees the sky po

lack to the saids reed. If there are no proper signs of f yea are it death, no will recarly the labely to said at the critical point. The proceeding of an afquair may be then a life-area. Lower powerful on it, use it as a means of judding which way to term, and whose sail step intended at it that judy no term, and whose sail step intended at it that judy not have, on the latest contract the sail of the process of the late of country. But you may would be see some of the late



Community, control is a better control of the property of the control of the cont

and the data terminals; or wast the next term shade and any data was transmission and profit of the street between the street with part of the street profit of the street profit of the street between the

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The British Empire Exhibit tion

Wonders of the Comprehensive Exhibition Now Being Held at Wembley Park, London



meanify give some bloc the vactores and plo-responsible of mean of the belidings and partietenor.



The facade of the Empire Stat

selected as the ment suitable afte for the Epoletica, live aix talks north of Let out of the natropolis. So complete are the count that Wendley can be reached in an average time of 18 minutes from 125 sentions in resired Lenders, and tithen from 125 sentions will provide a nevercreating stowers of transport for visitors to the Exhibit

area engineed promoting to 200 series and White the spare the industries con-ner of the seal set of the 400,000,000 of that inimits the curious portion the British Kassins are proportion the grounds to facilitate community between one part and another; and four reliney stations outside und one within, will facilitate the arrival and departure of the crowds that whit the Exhibition It is harred to attenue at agrange of needle to the whele population of the during the six months the Enhitetion will senate over Produte has been much for dealing with this number, and for feeding States within the Exhibition

utrie at one than, without debuy contains. Each section of the Kulthirion will have its cast possible with special local surprise of n, their ive in Inche, and Saleh the day by disting halldings rested within the Stylhillian gramay be roughly divided into two classes, namely, bets penet and personnel. The fenser, the those which better the Indian and Remove cridities, are, many of

Middle close, and call the prinates balldings will remain for one on Octobover-less, mosely, the Euglise Studies, the Palaces of Engineering and Industry. There have all been constructed at sold and the firstly decouraged Endidor fored country, and serve as complex of the improvive and artistic effects which can be eletated with itd- unteffei The Empire Stellan in in far the largest sports certain in the world, and regisherly desarts the Golberts of ancient It was completed out in 1925. and provide worths and statute access morbites for 155,000 people is in secretar on the rising hand on the weath sole of the Exhibition greenels, and rising to a beight of 1'et feet, it skewitzing the kende me for with amount the the first courses on which it was send for a big event Association Facilities Cup Final in April. 1921, difficulties note and with in our

trolling the hope recent of 130,000 which coresded and regued the humbers. Setter shoulder and recessories of the correcce arrangements has enabled this difficulty to be reservate, and the results; everythy of the Rebi hitius on April 25, and the Cap Flool match on Satur dry, April 26, were entered through this year without sty light, although the attendance at each of these events taxed the opporter of the helidity to pearly its tion courses. From north to worth the amounts research

> "HE najority of American tourists and business man trhe cross the Atlantic this summer, will not return trithout having sport a few days in Lendon for the purpose of visiting the British Empire Exhibition at Wenthly Park. American are put matter in the production of things and events on a large scale; and an Estibilism which is every aspect con-claim to be the greatest and must comprehensive "shep" over yet staged, am to be the greatest and mail conferences; "heth" the yet stages, contain to interest them, even if it only applies ideas for producing a lit greater Pan-American shate in Neth York, in crother feth poors.
>
> For the partiese of thirty those of our roaders who are madels to visit Europe this summer, on idea of the scape and magnitude of the Wombley Exhibition, we have arranged with our Special Correspondent in Creat Estion to write for as several descriptive criticies, essening the more string features and conformers of the Estibilities. These articles, which will be well illustrated, will appear in successive issues of this journal.—THE

> > full extent, and put the opposables to a percent off.
> > The species of King Green and the Priors of Wales
> > were transmitted by electrical transmitters and load. there to all parts of the later arets, and were been perfectly gut only by the 190,000 who amended the overlag consumity, but also by the utilings of other who were "flexusing in" for the course, is their own brazes all over the hour country, and its some of the or releases and dentitions which there the Kn

on abowing the specious sinies

mie of its

en sided, so that the wild simule which will be intro-seed into some of the pagand out of the areas with-out say tisk to the visitors dee Einstrating the development of the Historical episone sunstraint for Orrespondent or or British Negleo from earliest times, will be staged in the vast arons of the studiest during July and Augest, and the Arny and Newy will enterlists to these the

plays. The lies South are also holding a great jam-leave of 10000 scouts drawn from all parts of the finpire, during the first week in August. converts with chains of 10,000 valors and an orchestra of 500 instruments, will also be given in the studiers, which will therefore by the sives of a great variety of entertains and shows, during the six results

which the Exhibition will be open The British Government Paville the other seals buildings of the Exhibithe other reals buildings of the Rithliften, in planned an asserted; classical likes. The portion shraw in the acceptanging wire of this buildings is 32 feet in tright; and the strike of most for use of the King and Quenn when they wist the Endhillies, are situated on either side of it. In the central Court of either side of it. In the central Court of Hieror of this profiles, a gigantic model relief map of the world will about to recents of character lights, the growth and extent of the British Empioy: and on a water stage 10 feet wide, which can be converted into an ordinary stage in a very free salestes, historical scenes on the see had, and to the sir will be reproduced

In an enter to the main parties is a are theutre where fittee of great interest are meals; and the hone equity's productive separity in relation to the hone and expect trade will be illustrated by a language model of Great Britain and Iraland. The Post Office has an exhibit illustration the most up-to-date methods in the organization of postal services, as well as the more recent developments in telegraphy, telephony and wireless con Medical and adventify research are well

details reward are will illustrate and an important couldn't in their relating to region beath and hydron Fin lovely selectly of Landon, the door and most stemmarked by the first the facility, evidence has provided an exchange of the facility of the first fi

egiante Sersey are all well represented y attractive existing. The two helidings which hepse the in-natival and regimening egilidis are probdistribution registering extent.

In this the imposite that have been constructed in ferro-emerate; for they cover together a militim square feet of floor space, gad are stribing examples of what on he arhieved with this type of building su-They are placed one on either of the main avenue of the Exhibit



The Poince of Engineering, which is the larger of the two, is 300 parts, wise and covers an area wit and a half time that of Trafaigar Spare, London. Five follogap cultury lines traceres the tailf-ing fress used it work and are congected with the main trusk lines of the British railway system. With the sid of these and overhead traveling crupss, the exhildes can be brought to the spot where they are to be shown, and can be installed with the relations of later and less of

The section devoted to siduloiditing taribe, iterhanisal and gracus engineer ing, which is being organised by the Brit-leb Engineer's Association, forms probably the fixed display of general engineering over brought together in any one exhibi-tion. The electrical engineering section, organized by the British Electrical and Alled Magazarcurers' Association, conthe erection of which all firms have con-tributed. This station provides sicetributed. This station provides elec-tricity for running all the nuclinery in the nucleus sections of the RaidMiron. and for lighting the entire exhibition at tight. It is not that the noble will we lose the coal is tipped from the ordinary L. N. E. R. the into a several throing nee

ii. N. R. R. Hille like a special thysing need in the grand, and is then conveyed by resons of an underground instead to the burket which transfers it to the freeling bushers of the believe. The Motor Transact Section contains recommunity. exhibits of roots runs, motors and accessories, and will constitute which freely a namplete and attractive ex-hibition. In the Land Transport Section the exhibits of the great railway companies, and of the chief makers.

of the great railway obspection, said of the of reiling work will be found; and in the Sea Transport Servine will be shown the obsfills of the great ports of the Epithel Kingdon. Exhibits which are says to Kingdom. Ethilitis which are sare to provide of very great Educative are the large working model of an arctinary editory, and the "Neste Bory Relitory," attempt, de-scribed and illustrated in these columns (see page 50. February, 1978, Israel, This inter to show half a talle iong, and is worked by means of a continuous spiral sector, specially minped to negativate arrow, specially improve to negatisate gravitents and avoid all reletion and jacs. A frequent is the clare which has been fixed at what may be called the sent-circular fermines, to transfer the curriages be-tween the up and down lines.

The Pulses of Industry, the other remarked building of the Schillition, is ration smaller than the Palace of Engli terring and will have the exhibits of the industries of the United Elegates. Which do not come under the ownered



on at Wenbley, with the vast

exhibit to that often by the observed bedomes active in all occupies on some of \$7.00 wanter free The res trail feature of this display is an exhibit of research in pure charactery. The Association of British Chemical Magnifestationers, which has organized the Whole changes int, has been aided in this purticular exhibit by the Bond System

Dotton traction occupy #2,187 square Sent : a property affire committee covering all the Lancastice cotton interests has ar-gamined this section. The whole story of rocking productive is illustrated between tie spread of the real autorial to a me pleir working range of every kind of every k of establish of every well of dejoled into Weeks trailer consists presental Bredford Consulton, St. 13,000 square feet.

square tree.

Either and the north of Ireland Index tries orange 6851 square feet. The intique relates of the Government of this pecific of Ireland as part of the Engine, is reaplanted at the Eublidian. Instead of harder a security as accurate auxilian in the example.

the literapped has taken one of the need president estates in the Pulses of in-their, and his organised there a show of the periodyal Direct industrie, includ-ing whilesisting, first and litera, and benege Finally, in the section devoted to muscal instruments, the risking will be able to hear over, out of British instrument It a write of supplicated recta-

The partition wideh leases the eshibits The partition which house the exhibits of India, butter and the other for easiern partition of the British Bopte, also the buildings of the self-governing Decriptions Cranch, American, South Africa and New Zooler will be filestrated in a later netter. Name accept will be given also of the next important conferences which have been planned for the animary months, in subjects of world-stile littered, as three reach the stage a which the reporting of their activities become profit The following are the same inquiring A Mining and Metallerated Octavor-

separated by the Inchests of Mixing Regi-Heliala, and other belies where interest lie In this Soid, A World Power Conference, organism for the Reidish Electrical and Atlant Mana factorers' Assertation, and extending from June 30 to July, 14

An International Adventising Conven-tion, organised in the Thirty Clink, a president group of British advertising men.

A Textiles Conference, regulated by t Tratiles Institute, and always to over the

Vertical technical and occurren that bulk burge in this field Official detegates from all the budgest terrafacturing countries of the world are stirading their gallerings, and the premeditize may be required at the nearest approximation to a Boriel Portlement of Schoter and Industry that has ent-



The Pales of D biolog, with its master profilestor and relational re is employable, and managing but feel is with large in which the Wenthley Exhibition is bound rate construction. 2 The Paleon of Engineering

Long-Range Weather Forecasting Predicting Weather by the Year in Place of by the Day

By Herbert Janurin Browns person of the C til Stiller September has



into hest of that extranely small fraction of the again malnoise which implages upon and pentrates the contribe storogless. Ignoring the wide and intrinsi-variations in westign types due to inflictely, leads, menticles, plainure, dascin, avents, cleans, polar les, and the initial to-rement of the sen in the ectipit, there bragins at rément of change which out be travel definishly to long-period factuations in the sen's Administrational extreme declares that the extr is a vari Administration with part to price. Its wifting table size, already well part to price. Its widting surface (expectations are apply mindget pherculis)

and monomentally the Astrophysical Observatory of the Neithenian Institution, under Dr. C. G. Abox and a corps of highly instinct sweetents. Two stations are methatoric, one at Monor Harque Halls, Arthreis, te otler at Ment Menteurs, Chie. fewere by the variege atmospheric elements have been Early next activities has necessitated revision of the whole body of calculations, buck to the Issue 196. Per op Incorrage decembration receips, that of the once element in the uncer attackberr the there are noticed of expert, is densed by the action of the attra-claim rays. According to Dr. W. J.

Hanniers, the collect principals, if all the up:

or to commone the trule and eventur-trade winds The course, since to requised to charges in solar mainting, surrender their accomplaned best with optal ministree, surretiper tirely accessivel that with equal deliberation. From the legislating of 1917 to the end of 1929 the solar constant was high, reasons even to two gram rabeles per square confineer per inteste and averaging well above a normal of eligibly under 136. Using the Atlentic Ocean for Distriction, the primary Geri of this rise in the main continut was an increase in temperature of temploid surfaces, and, in secon an increase in the temperature, rolume and current of the Gulf Streen. The northern arm of the streen flowed into the Norwegina New and Sastern Arctic in terrange during and it is higher betypersities. The sun in its incellent boars will further aided in riching the impressions of Arcels searface waters. The fixed supplicates to Reliabeleurs in the seasons of 1852, sent out by the University of Christiania, re-ported in lengther was as far north as 80 degrees, 20 minutes, the furthest month over rearried in open water with modern meanagraphic apparatus. The Golf Stream could be traced as a sortion extent as for as To depose, with a surface traperature of 15 degrees. are digines. Such a surrier independent of 15 degree Chicles applied a meal summer temperature of thre-degrees. Gladers had neited, expeding for the first that on record upon neithbors while the magnitudes of this further indicated conditions are paralleled in a centers. It should be noted that the beginning of the



Measuring the curves for solar constant

ture in advance, is listed on correct to-terpretation of the effect of solar heat on country surface temperature. The sunia is awarded in terms of the relat after the respectator, speed and solution of the name must which is tern shallarh infarme the







celd constructionate unit, together, the ultim, extent 85d temperatures of the celd-mater areas, perficularly of the traperate and solutropical nation most of our

subpressing excitive percentrated highe and lowers are governed and affected, with their resultant winds. and in general the tengerature gradients between the

small meletine latin alade are generall and out be Statistics measure. Statist in exhauster with the polar high precage areas, the ownth' sub-procedured highs and how rim he used to furnish the frequency, intensity and owners of the syristic loss, and attlesseine, higher which work to protect the equilibrium of regular heat and point cold and of vertice and appet alre-

The foresity amonds contains the large to the sales tion, not along of long-range weather forcessing had of all weather freezering but be lained to the empirical all wealer freezening an included it lier expension methods of the dally weather take. Occurs temperatures tend to stabilize the wider fluggations of the atmos-In the stid the fense, green the prostal feeture of the weather. The full decomposed of tide seebod will require occupant until repete form to welltraversing the occurs, to every fully serface but-persistences with the presistence of the conface, air presents, imperation on husbilities, with general netromological observations. As there are thousands of vessels, including terms and other government cash, giving the oreans, from a lose motors presented competent tolunteer observers can be would, no goes espense would be introlved in the development of world wide oversic and weather formaetts; available to all

earth under atteopheric presente it would form a layer to thirter than a pape of place, and its effect is exactly that of a puzz of glass in a growth-use; it is trug-pured to the shart-leggth names of milar rediction, but is obstructive to the entrant puwage of the images never of each rediction. Once may oversel for or back as those degrees of the earlier average ten-

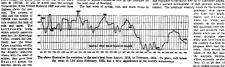
earth's surface and furnish possibly absorbing of the possibly which waters the last That moletyre can be tong that minergy cut or better inleged out; by winds. Hence the key to the winds be the key to rain. Weather So-lows the winds. Winds New In curves treated lower atmostherefree 10WIDS. toward wareth. its in success and cooler to whice. Hence malescrebearing winds lend to blow ignitioned in senses. This is

belts by the besirency of starts content abertain at the sun-face and in "like constr-tands" in the temperature trees, that is from swatery directions. But sufficient map-perature-present gradients in tauges was dated back to as far back as the year 1905. The increased flow of the northern arm of the Gutt

Stream and the further heat expansion of Arctic waters become fit dischared an explosion quality of reld water, which presend earth and it large part found its expansion in the culd-water area which pracrity like between the Awares and the Spanish Coust. But the authors arm of the Sulf Stream section in home vothe private to patricipated latitudes, in the tarm had the effect of resident the emphasis of the Assess and



by the year 1922 several hundred railes south and west, bequence new appear, fugging in their effects several years behind the initial come in the rise of the state he noted that the average terracestore of the Utiled States in 1922 was over th degrees above the nec-raal. The automn of 1922 and the winder of



er, they gave New Biggian d street the besting street of the ord and then name arrows the Atlantic, which for six mattle lad the severed storm period in 100 years.

These loss strengthened by their contact with the Sulf Street, moved appenally into the Horizon Acutic and Norwegian Seas, and emphasized the carreling which retails spirally invarid to the left strongs the levingit law. This course in turn engineered with veg testberly winds the odd continuous which form doesn the east coast of Greenland, ground ('spe Parcent's and Into Davis Strait, where the re-fields were broken at an early date and set free their laur

were broken at an early date and set free fleer large masses and the beeleng firsts which made motable the motar sidentic of 1923. The persuance country atmospheric loss are in-variably found over higher of water someor than the sir, and posently near confinential moves which, it where at least, develop high.

In whiter at least, devised blabs.

The Automa cold water area, boing in the autohem belt of high presents which endreisn the autoh, business as a stransplactic high by its chilling effect, around which the deventing air contents which spiritly sufficient. The expandent of this cold mater area surth and over 30 the period following 1915(3) has overlaped as provised for period following 1915(3) has overlaped to the period following 1915(3) has overlaped 1915(4) has overlaped 1915(strager while than touch which is turn tend to bles the surface values, as they works, subward in all direc-tions toward the excitoding field Stream. the the metherly quadratic tide gives while which drive chill olsters into the South Atlantic and Rost Gulf States, where during 1600 and to date the reinfulia have been exceeded and inferiors to agriculture, particularly to cellet. Numberly, the methody quantum a decelop the malst winds which have for the part 12 months delayed Spain and Italy with incretive of unbeschof rains. These malyses of weather examines can be applied to every expounded confidential area in the world were Beginning with January, 1921, the wiar constant de-clined rapidly from the high of 1915-09 until by Nep tember, 1922, it stood at 1,813, the lowest mean re-

carried stare the beginning of electrations in 1905 remained pershelestly low until in Mania, 1923, when it recorded 1,300, then rose to 1,200 in August, will below normal, and their resumed its denomination on the below normal, and their remained its demonstrati common. It is, at present writing, at an extensely law point. The shift from the muon light of the 1917-20 recting to the law of 1927-24 indicates a goving of one 3.8 per cost in the ever temperature rearring the workle stranghere and, as tearly as may be determined, our responds to a deciter of 4d degrees Patronleit in the

earth's temperature

There is, of course, no

from distribution over

weather features of the

pours 1923-24 are two-

secuble through later-prelation of the solar constant of 1917-25, and

certs of that devites In best, but the sawrtion is made with conf-dence that the reals Surplem Racked and spontane, in Itels, Preno and with freezing respectives, breaking records two connectes. The Australy cell area was as for with and west in 1925 as to dernit of West Indian harristic seaso. In the Northern Floris.

ervotory at Mount Wilson, Cal., for studying

state and other phones the ore the vibries of 1825 and unprecedented shows Argentins and New Zouland, while beth 1907 and 1909 have received fixeds of great worthy to Africa and this wide expresses of the Buddy supports the last

period, couples now in 1920-24 with the severest winter unbepressagest Partie high develops. Under the change of many years in the latter country, and with now conditions of the last five years this cold-water area months to in the infection of last a repeated to the parts well up to Vanovaers [alan]. with a sursed development of ligh prevent serse b quetrant- New rane altra natural trans Wards

higher and Gragers, while the winds are control on the methwith an electric same on dnostri els progress since had the takes of the feet that the southern Sterres, which are notice from 15 to 20 feet a store, girtte storage for

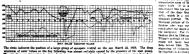
the success insignifies, were bare all scines the stander ferticistic, were more all writer. The writer is about so recent obserbers as having furnessed the year 1004 as on the whole a collect part of the best of Matter, wet in the sentiment and rational professional, model in the assailly day coarse. country and the plateous, and drought-ericles in the rountry and of the Mindespel and north of the Ohio and Peterse, to well as in central and seathern Call torths it was now be stated that every comparable now in the world has had reveally, is invite, or will here this yest shalter weather Attention should be directed to the first discount

by exacting the logs of theseands of season picts. the seas, that the seconds are now over stancages well help their movember propriature. It is not in peoples, but a forecast based upon notocologies facts already in orderer, for tions who can currectly interests in entered, for time win our correct, interpret, that the year 1955 will be a severe one gen enably discontinent the world, and that 1900-1901 may witness a return of 1816, the "Year Without a Stranger The HOLD period should see the Sixt year of sample feather with a re-street further from its west radia-tion, and its inswellate response in devicing already personne, already less and certain to so continue, will persistence, siboury are and certain to so resonance, was safel their influence. One further ricumst alone in re-quired to reproduce the neutron of 2016—a statem to easily crossion like that of Avanua in 1783, Tomboro in 1975, or Krekstre in 1993, or a series of lesser rees but sufficient to three into the oper air a large sub-ness of whentic dust-to reduce the sarith's terrore ture to the required degree, wear 30 degrees Falorin left. In 1686 there were no crops related Legith of the One and Person and her seasy returns med further South. Free, sure and he appeared in every booth of earlier attenue and (all It would not require a completely sold sussener to appell dissource. To out-fiver hours of inspeculation be len freeing about June 10 and a studier period about July 10 would decine the grain over of the Differ years and Collects, as well as much every of the Dates Plants and Collects, as well as much every other grow ing them. In 1816 for a helf little black was formed in the East on July 4.

Pertraits of Columbus

A PORTRAIT of Christopher Columbra frond a share Bears in attributed by 41 Section to Titler. It is from that the partrait backs the spantenesty and spirit that d Ti cincuratively need of It is it

this report the deep Man truly of the deep Man rolls, which is a year throwers restrait Sterner pieters of the brades also was ego cuted after the death of the naricator. For Co. banders died in 1306 und Busines died in 1206 und Trium's partrait of life could not have been dame beines 1205. The eturning of Colymber by Capricks is no closely triated to the Titler peinting to to expect that it was creded from the latter Har in



that the weather for 1925-26-27 has already been determined by the The date infection the position of a large group of mengatic rectified on the zer March 22, 1825. The deep relations of a later values on the day following was almost critically caused by the presence of the replica-The simultaneous depression in atmospheric transgeneous, as indicated in the green rays curve, may have been caused by the boundardood of the early's attemption by joins from the saw which such as content of conformation setar constant of The transition from the solar high of 1917-20 to the low points of

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Our Point of View

Unredermed Ugliness in Bridge Construction
OBK on the new emperature larlage to tree the
Harbour or thrus Shanning here progressed in

Finding it for extracting the processing of what the good structure will had like from the contract of the con

of feligit (the legal supposes friting in substance and built on the new interferie set of a great orienting of los kind in the sortal. Here, storily, were sit specitually and on specific the short have explained as a loss of the specific set of the same and the sublational front-set, would have been because in an interferil front-set, would have been because in the surroutings. To set the tensors the super-side is surroutings. To set the tensors in the contemp from home in inter-side tensors before gravitative-impress at solitation type in the engineer or may large the set of the surroutine surroutine that the conditional content is the relative.

But considerations of arcialectural secular secular states of the leave land on part in determining the continues of this lettings. On the secular pit where exhaust of this letting, to the the satisfies of this letting, the state of the leaves of the lea

The nevers of a suspensive hidder lead the section to utility treatment—as without the Manhattan bridge—but seed to see of this bridge hooks like a polic of temporal policy and to approximate a special regime of many. Here is then work sub- an experient regimes from the regime of a service observation, or one of a service of them that hidder the second many temporal regimes of the second on the basis of the next attentive service of the Helmost Nove, they are a bird special for except will call down the surpression of the Helmost River, they are a bird special for levely that will call down the surpression of this presentation.

down the stary retent-of filter parenthless. "What master of typels were these of the entity posses of the Yestellish Gatany," they will sad, "had you shad to be the entity of the Section of the Sectio

strature, was "visit will in yes," and the last "less will it leads."

The anter-level confinements that has spelled the toware has that its only both or well upon the present interest of the opposite. It would have been sent increased in most their in most the legs and interpretate in most the legs and observations to expense the first, afterway they are as simulations of the present and out of the less of the present and out of the less of the present and out of the less of the l

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to the applical shifted wereas results in deathopen exercitors; but a windows himself one of endonemation in long-on-being design to the on longterminal to be an independent exhibit shifteness in the
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The Novel Situation MING the past few months, the public has been presented through the dulit press with a net areast of decades of the exposed washing of the United States Navy and its to movement to be \$40 standard greater part of the Sternitors, so far as the standard is reductively and extinsive wide of the mark: this for the prawn that it covered moral patential that does not our within the score of the Workington Treaty, which desit encluded; with expital skip and simplete excelstrength. The Treaty, as finally drawn, had betking to very short the criefles straight of the puries in unarment this entires determ admirtes estbusts and supply offer. Home, all there attacks on the Workington Trendy, so for an they deal with up arranged withou makes the point entirely and have tool stateurs to do with the question. Therefore, let it be and approach that ender the Treats the Deltat States lobbs today, its full value of 5 to the 5-50 rotto.

The standing of the United States triatively to Gree Beltolis and Jupon, in assessment skips, is not settle factors. So fac as pupilers are experted we hold first destrooms one on the entrary senerties before not their gaily project, of high speed and carrying an three-led terreds apparent. The submerite elication it need by admitted by the fives mathematically though not needly so had an ease irrequasible plantists have stated. We are weak in security salcorbs could of secrepating the first; for these Congress should make the meeted appropriations. In the matter of light or senst craises, we are relatively week! hat we have made a new flar want with our be 1980-on, 34-knot englers of the "Etchanted" true. Support, since other nations are building a certain number of craisers up to the Conference Built of 10,000

ions, and second prescrib with grass to to the Oct Denger Staff of eight Entire culties, Congress should appropriate for at least right obligs of this type.

In view of the course prescripted articles that have best written sixed the reterior shipheliting even the is common dispo, we here said new exphatically has been and there is not from any each exception The endwer which the vertices particle are leading are only stack as the deportation of the older ships a the better of the list preventates. There is naval secre is the Atlentic and it the Pretic, and if our Proposable Decreasion will only refuse from secmarranted in-nits as that reweily offered to Jacque this peace will be uninden we believe for many a decade in over 15 Owares had left this matter to the lands of the President and the Services of Mate. the deduct would would have been address address. degree to the motal feelings of a friendly needle

The Mysterious "Death Rays"

Ministr the pressulate of scheme in the manician ray, Every we older the started for reports of a new new site design and for reports of a new new site design and arthritecture prescripting stephney in right, exploiting reasonable, dissays or a discover, before up shallskip, by descring their measures, tilling smarp traves in the schemely delimited the power loans of the element, and bringing to a land every automatile while by the report to the scheme of the element, and bringing to a land every automatile.

The repression may be a true permitted of actions. It was stational where there from the redshipment numerous reportion with a final final

had a representate may which they were using to down Protect alreaders fatzg over Bayaria on their way b the friendly cities of Prague and Backarest. Alrew a year ago a French inventor is said to have dete strated a prosperious cay which caused Puristan taxi cale to stop when directed against them. Becently, the garratone Treteke has told the world to beware of a nes Bussian death ray. The German militaries, Her-Wulle, has informed the Beichstag that the Fatherism has a district my with which to play have scent, unfriendly almianes tanks and main. Married free fine to thee, has been working on some presention out for destructive purposes, arrenting to runor. Britale has Mr. D. Grindell Matthews and his dished my which, thanks to extensive publicity, organies the Scritters of the prosperious my firms of the measure What are those douth rays, diabelic rays, death draling mays? No one except their sponsors really knows. We are told all kinds of amounting things bu gives to provid expert a few unlessrooden laborator experiments. On the hade of our present grigatiff unledge, there is a very alts: fregulation indeed for these numerican rays which pure le predected through space and come the destruction of lighteen systems, the explosion of produc, the burning up of structures, the destruction of life, and so on.

Groups about in glob Stedieses, so to speak, we readly skylind of these superiors are pay. We have the skylind of these superiors are fitted to there, by one of the properties at fitted to there, by one of the properties are fittle provides the same of the properties and the same properties at the same payments are the same payments and the same payments are some one of the same payments are same payments and the same payments are same payments. When I seek have been a same payments are the same payme

Coshing in on Ponome

great engineering venture has never been distro That we should have gone into this free-infected district and ricaned it to until the bealth conditions restrained with these of an engineering project in which the French had falled, that we should larve deabled the proposed six of this work and three built it for less than the cost as estinated by our start stateours, was an accountable ment in which all Americans feet a justifiable pride Not only was the canal costly to build, but there was always the locking four that It might not attract out Srietl traffic to pay even the cost of operation to say nothing of sufficient returns to expertise the expenditure of custod. Today, because, after less than a dread of operation, the cuttal is not only paying its way bu is showing a very respectable and rapidly increasing agrains of carnings over expenditures. Thus, the ludget director property that up to the beginning of June tide year the cond broak here assessed \$25,654,780 as compared with \$15,688,447 at the be

Child one approximately \$10,000 to yet with a set yet and there may appear to an be used to lower the lower through the programs of the property of the point \$10,000 to To prove proposed to yet and the property of the property of the set of the property of the property of the of all fines awards of collect as the collect of the property of the property of property of the property of the property of collect of the property of the property of property of the property of property of property of the property of prope

Now the unkeep and general operation of the Panarac

staning of June last over.

Here and There

MCCH space has been given, in our own columns and M to those of the duly press, to the helium gas embeen the explosibility of hydrogen and the non-explosi hilly of belian; now the great expense of preciseing the latter and egain the progress made in producing It at a reseastle figure; now the certainty of a cuftriest empir to warrant its use in the life distrible: now the reparkable investion whereby water builted is recovered from the barned guestian sufficient to regain the less in weight cassed by the outstruction of the feet on that the hallow still more expensive than we should like to have it, need not be returned to decrosses the becausey of the ship and person a landing and so the latest chapter, we have the sevident which led to the records for valving some thousands of cubic feet of the previous inthus, in state of the hulbestrecovery, to stold the presents for keeping the slits in the six all right in a fag. More or less a central figure in all this is flureld S. Kennety, checket at the Reven of Mines, who has hed his force ours needin the cir the sactors the experimental week leading to the use of heligas in actalism. No very central is he, indeed, that the tendency of the daily press to look upon him as the "Manager" of helium may be pur-

N this requestion it may not be union to recall the pricel riversetators under which believe became known to as and expliced its name. We should, as a matter of fact, reverse this research, and put also personal for the many first. Away back in the 1990s. spectra of the sun taken during eclipses broad to show. under the refixed instruments then for the first time arnitable. How in the pollow region, excrementing to these produced by he known connect. The oute conmineths emission was that they metalized to seem elected which either did not exist at all on the earth, or which had not yet been builtied; and the recognition would not units by that this was a very light one

sheet. Mr. Kennedy's controll concern of the coner right owner of the may.

which would be weight in approviable quantities mainly in the improvedble upper regions of our stsemplem. It was not ustil 1866 that No William Excess finally teristed, from unit tary atmospheric sit, a very small percenture of a gas, hitherta unknown, which ger these same spectral lites. The trainthe bireffication with the substance present in each quantity in the attacephere of the sen was very seen made server, and in recognition of the curious laboury it got its more—which, for the length of the nondestiral, we may remark is derived from

the Greek weed for sun ONE of the standing jets about the typical American to that no one has qualified as a gradue product of our soil until he invents according opinic. He is fairly well known to the credity public geograph product of our and until to invents assessing and takes out a patent on it. There is another rather characteristic infit that is not toticeable assess our city dwellers, for lack of opportunity, but that could cat be advanced as a prerequisite to the rights and

privileges of citizensity to our rains districts—and that is, to have discovered a win of mineral descrit of some nort, and to have not more or less excited over the proports. The farmer who doesn't have this happen to him spectatorosty usually falls, some or later, to the course of ig a cellar or a well. When he does he must him mediums to his Unite Suruel for analysis and report;

and the postimum whose pretrait the reader's eye has just left behind does the rest. He

is timege Reign, riskt details of the timinated Ransee. One of the delias of the Xerney is to keep track of our paperal wealth, and hence it is natural that the tank of analyzing the samples of one and neurone out influent by our various hopeful citizens should fall azonety, by prewas thinking they have freed gold or nor or some other initiality deposit. Mr. Striper and his solidate find that about 20 per cent of the speci norm consist of only or retitive; and a large atmosphere of the balance have their value in such shape that extruction would be apprehiable. But the Geological Seren's classical size dang't coffee its articities to whater extrinsions; the Farrey law sets all one the exister whose whole brokens is to tile up and reduct for test possising accords, and Mr. Nedger's mest profitable work in its the owner of them core, and

the publication of the findings for the galabore of IF we were usked to tame America's Service physicist, we about probably drauged a farther classification, on the sine that physics has an exper benedice that conjudges bewelt the farmest electrics. the garagest afabrat of alonde coprises, and the foomest worker in excisenting

physics would be impossible. But whether we were greated this revised finally or but. we could not start our list of leaders without the ught wrives thought to the place to be given Dr. Robert A. MURlan, of the Cult forsts Institute of Technology. 14, Millbut's medality in county physics, and by has done about an oracl on any other Attornless toward the present very autofactory di

of this branch of selectes. His reporture to healthy to want the measurement of story and electrons are fidity to be observed as enchanging and has entitions are such emirbolics tream reception of the fact that the electric and post-of one put twee sames, but notually correspond to the restition of the case. It is his work in this first that has earned blue a Nobel Print award. Judgits;

from his face, he might would, with an neary others of the provent practition of advant, or representative of the twested century time that skings expells in the abetrare works of science and in the ottor tical affiles of 25

MORE regretor of the siddle protes world type, which is never or lesburied in whate and more or less described free compage things, is the periods of Dr. James H. Rresnel, of the Enteredy of Olege. For a full prompties, sharet, 2ir

as notice of a back which pure the bloom of Egypt In thing free before the modern moder, and assess his scientife collegues he is programd though the ey meturated was, of distinguished of said the another and more popular volume in an elections The latter book in fact contains the same about in its of Benn. Dr. Brosserd does not come into the politiope un retires as the leaders in wear other departments of reward, but the Tutubkharwa first have given him an opposite to we like name in ordat, for three is telegic in this overtee whose rathles on those is of mery mornet than his or whom study of these tools

A MONG the admitted personalities of the small in the approximate that Roy (England Andrews weeking for the American Museum of Natural History. will be in Mongalia and Gentral Asia for a aver, start ing sect spring, to search of early hypnes and permaple of the possibilities, a single limit of Tertiary deposite 2000 Seet think was in ceted but year and will be celer the stiration of best Tour's arredition the the leads of fixels to date, the Museum anthorities are in ritinal to believe that the Gate regions were, un lette as \$3000.



N interesting echo of the war-livenity as well as A Notice leg con to the control of May, when a therpy, of ten tone of codinity was determined in the attempt to deplicate, for correct study, the "seems of silvare" placesories observed during the nur. It will by received that heavy bushardness; were frequently

board by observers 200 sales or some disnot from the seets, while at points in the Same like had mounted on 20 or 30 miles-melting was house. The results, so far as complete up to ear server than helper bear for to metal were traveled in rarred sails through the user of and describing In the such beyond the name of these that trured play is the surface

ENVIRENT have sheed for competition for

States pounds for a believed furtiling the medities arrestled when the lest was an negative and the state of the s true's, factoring over of the most notable European and American experimenters in this field of fising. It results only the the Mitthery to fix the date for actual To win the jette a markine must perfern a straight upund-drep, flight attaining an attitude of 2000 feet; a bewring flight of helf an hour; a circular flight of 20 miles at sixty sales per hour; and a downer free an philitade of 200 feet little a small area, with the explorstopped. This, suggests a conservative little journal, implies the production of a marking alregative too far beyond the present apparent stage of indicapter description spaces to Justify the expectation that the prize will

be wen by one of the present applicagion

ON the coming of Thursday, June 12, we witnessed and hourd-a striking depotential of the facilies to which the very latest sciratify developments have been selved upon by the purveyors of pear, and sands a part of the mutite of twenty-bentury space annihilation. In the sitting room of a private residence in Engineered, N. J., we thermed to the remainstring, in Observed, of a Registran continue for Ylandow dent. Nor was it say fifth hand successy of what was pulse on them the convention for that weeked our were. We know the electronic rell the States and anhouses the results to the floor. The quincoun for most of the State delegation ners mater safeteethy given to the platferry, with its missespheres, for an iless their automorphis to the Clair, proving the that accompanied leavy vettag for function profession the spherocouldage between Chris and flor, nor had countries at the perfect reproductive of more attenuation to our heat-engine, or by threespite of others all over the country. But we say a blok sail of the sounded that was draind the source listener, to we had with me, for display to our friends, plantagraphs prints of the exemption pictures made that day not transmitted to New Lork is trippings or proves so new that a description of it appears only in this loan Between radio and pictures, we were in the actual present of the expression to an entranelliner degree





Growing Our Own Bananas

How Florida Is Establishing a New Crop in Competition with More Tropical Lands

By James H. Collins



a sisio in a full-grewn

plazi. It was the agole of his eye, his petde and fry, a Glutt Abputnish Mose could, that he had raised in a flooreget from a laby bulk, and kept candown in accuracy and indoors in winter. The pess and green of the exetic plant-creature fami-

erre apiec. In Abpudata, Hose execte grows 30 feet, in Defrekt, it attained the magnitude height of two first, and/was her made of the neighborhood utilif one her ope when, left the close to a window, from an death. if free to Geath.

The you reescaber, as a lift, issing your first Gog-er hitten? It was like that, and he never farget. But he never had the heart to adopt another banens plant

One day this make manager fraud him-net bound for Kleride to take charge of a large land development being carried out near Trapps by a Detroit automobile big. Figrids was now and affuring, with its citrus fruit, avecudes, pulses, super cape, selvet beaus and structurely in December. But must of all, by liked the

December. But meet of all, by likely the hearsa plants held to deep Pervilla garden, and travelling over the Stote to get lit hearings, was estanded to him. Heary-hear have the hearing was being indexted.

The stop of the store the store of the contage and graphed that the market was girrad, and prive fell below the cut of produc-tion and shipping. Fletch has for perse supplied the fest struck-tries of the season, around Christmas or enables and the other property incomes, beaux effects letters, new pointies and other regulation. But despite the State's extension in sectially cases, the hands was not grown organicativity—or only leasily in a small way. The fruit was brought in by the only Sanisi way. The fruit was forught in by the early spanish stillers from the Indian or Goldman, and for fruit him-deed press has been a descripted coop, supplying the family Occordinately, when a Firstidian focus man begames in his garden than were noticed for home way he book a buzzk or two this town and sold them to a grace, senseally for a very satisfactors urise, because York or New Orleans, sold for sever to too order

period A few gracers had small constantial access, welfay to mouths office, but there was present south ing ne latrice industry in Florida nor in may part of the commercial Cultud States. In competition with the tropical baseon, those grown in Florida had two shortnessings. They were of front

as review and two observed by. They were of front surfety, about hell the view of the fruit-small human, and therefore not attractive to proclaimers who did the have their they quarty. And bring dwarfs, they did not yield the formance per are the humans grower de-pends upon the profit.

In the cases connections

in the great constanting markets of the North, people In the great constraints marrors or the North, people est fruit principally by the syn, paping the less prices for size and color. A human like the little "Lady-fager" grown in Florida desergants would quickly projetted to the products of the lines Note, and he sold griving to the protective or the hole Note, and to write difficulty there, because it is no great shakes to look at. Have a little faith, however, post back its yellow edit, and Niv into the ripe first, with the rich flavor of the tropical red branam, and you will discover tales are in the wor of a delivery

"Some day the print American ententier will been to eat by these in-lead of size and coke," reflected the Detection, "Then there explit to be a market for the investment in the cases oppn to be I market for those dwarf humans on pool enting. But who are they entall—car't Phrichs rades hings benazans? He began solving quoteling, talking with anybody who could bell him saything about benazan, porticially the benefitable "enchant" who had then in Phrichs all their lives, and love thaty things not perceptible to the tourist or record artiles. He discovered that fine-flavored hig humans in longthes weighing 50 to 100

postde and over, or afficiently as may you over now hanging to a first debier's window, could be grown in Frieds. They were already pressing there—life cracker friends took him out back and estillated ful-sion End Jennics fruit on bealthy plants, and pro-lets plants for his own quotes. Finish basses were proceedly small, not because noticing but the fiver variety would grow there, but because the plants has depayment, or were but fertilized or cultivated, simple

The nucleon grouphorn, Mr. W. E. Bellos, hearing a beauts authorises. He per plants of several visibles and broam provide these with regular cultivation and fertilization on the plane near Claimes. Hig handles of the-through first regularly, and they were raised at a cost that made it possible to compute with project humans and dever a the profit to the sero. Earling pro-

concurs and easy a may price to the acco. According to entitle district that he ented not letters celling a ment-long of people interested in homeon, for the purpose of organizing a become greatly searcheden. On the day before the meeting an undersal rule and value deem "If I hadn't been the one who set the bull rel he odnirs, "I wouldn't have gone to the meeting my list it was my day to be there, and I permade

friend in pa with see. As we drow hist nown, he said be had sense slooping to do, and would come propri after its meeting not started. Walking heldy into the hell. I freeze myself the only one freeze, and not an other wal showed up the next half hore. Learing the half, discouraged, I get my friend "Harfs the marine," he asked

> What did you do? uply righted the officers and adjustment. I

"Unablework vicinis the officers and adjument," I .
"The health fits on the plane present."
The health fits the wild game is been as one one as a president of the present of the present

The term and the control of the cont

roots overed with a thick binsies, earth, where and peeding, there is a good chance of carrying the need through extensive and of carrying the need through extensive and extensive and extensive and extensive and extensive and extensive the facilities of the extensive to Friedmann extend to Friedmann extend to Friedmann extend to the extensive and extensive the ext

in produces large bearine of first, whigh lay up to 250 possing. 200 is 250 bearing of corollent favor. An Cweedelb is low the plants of the plants of different the hardwar worlders, restrict the cell of the seather lawrest in south Earths, we though the inp be from down. The later is seen income as the Ladythayer, Orider Earty, and Horst Choles. It been keep bearines, the is taken as the respect bearing that the Cweedelb.

Slightle color on the trutk and leaf steems, and enumerical. It is hardy, stands exol weather. (Continued on page 186)





Telephoning Our Press Photographs Ingenious and Practical System of Image Transmission Worked Out by Bell System Engineers

any of them.

cases to be frequisions. bester and

AT persistent among the criticisms of the or head, the instance, or examination of her chair Sections Authorized the persist Authorized to the specific field have been that we are heaty in dissiplinating our medicine. We have no long in 18 includes, Nov. 8 in 18 includes, Nov. 8 includes and the specific field of the control of the co

g the cur consulties no new and difficult ties, to which the ne should be ad-i gradually over a period. We retret a pracine mediene es initial perceet blanks, while to We have bart to deal th a catalidate who would eit Indeftultele in the effort to build up whatever of atmosphere may be presently for the petins of genuine

ow reduced to perfor-since. With the people's expected in our July a under the pseudo-

ottee has had, up to oute wordlet, it will enterly not be a hasty one. I have that those of my present readers who miss my July article will order to it for the present facts of the medianekle. I report here only that PH is the medium's hardend, and Cherier her freeward brother who figures as her "rettrel." This presenting, if not extensity Cherter as it claims to be, must be either a erabe deality, a Raissperious invention distinct from argine deality, a maneurous inventors concern tree se deality, or an inventor of resolute and francis at intest. Whatever is believed plant him, one must irted to speak of higs by name, to quote him. without enesting

Approaching the case so slowly, and interting new and the gradually as we call, it is no outlinesten date. In Margary's house. The introduction of new in Margery's house. parts, ten provedures, new viewpolars and new rates, ten provedures, new viewpolars and new re in stallment design for the prefest; we need esa have beener lucrospatify regularing in the old For the sure reason, so offert is made, agree at the sections, to exclude Margrey's accordanced addy sitteds takene presence, however important we be everytheed it is, involvably suggests the lay eals of evaluations to the conn from Southle or Like Markery and Pill, these sitters appear

ff, we have had several sitters identifiable as "on our fe," These include Mrs. McCongoil and Mrs. Hed; Octant, Dr. Compress's laboratory problem; Mice , Consts, Dr. Compress's inhemitry makings; Miles and, his secretary; Dr. A. A. Haback, Hurward cel-gue of Dr. Mcliougall, and Mr. A. C. Lowerthogra. manualtic edition

Pergane he believes the phononers to present force under this arrangement, he pulses inside a place next the medicu. The producting of his ing octually a comedium seems sufficient to lead us derive streets of granifus lifes the desired position. arthree tide by posting a consultier since instally outside the circle, in the space is seen PH sas Margery's hand, nor she his, he negatly not of the daty of sustant fact control; and he is left here of the dity of tourise not control; and he is not tith one free hand to conduct any further exploration rear to necessary... the location of Manura's office

res of their and inscense must in many entire of the investigator's took in to believe The promotores of a dentity by Mesting ! the relatively rare than that are notatile became with with the one brookens or with the other. To one who

pertir of no fraist. nuct observe h the paydor's end the plantack end otherwise were the beight of absurdity. It is,

pet septement to other win: e dace er ber putienge not com appears to app For invaciat

explained away. But but worll the case in

| 20 to June 4 Influero, Dr. McDungeri has been sent time times, Dr. Ousstack 25 times, Dr. Ou-land times, Dr. Ousstack 25 times, Dr. Ou-prince times, Dr. Frince times, Dr. Frince times, Dr. Endock eight times, Mr. Lencchoun, Suur times, and I 20 times, Hr. Endock end I 21 those Starting twice we have led part of a sixting without him. Since we started I have for a total of 21 days. Do

erringing fee 18 and Mr Leventh-use for four. one for ten days era through, and naturally was much better able to cherk up on Margery's entire activity than any noise guest. For hours at a fines, Mangery will be out and members of our consolitive in, unharr-pared. It seems obstruct that, at the very least, pr

freed requiring any large properation could be resistanted under such Now the guilty pe In his corry act : nor does Importat one sa Ita

dust and otheren there is the dust, Our finet considers seame, as Agril II, was of interest here. Franking around from Margerty's sight, the circle included IV. McCompill. The hardware, "Feelin," Mr. Mc-lett, and the control of the control of the control of the McCompil. The control of the control of the Margerty and IV. My control here was manifoldering at few, and hence of difficulties put it up way, but herease I was experimenting. I proched it is their to make all measurest proceedings. The only other person present was fir. Robots, a rooting commission to wender about the more a roung commission to weather about the roces, discours or prevent from the prostice of sight an series, likely to bob up any respect at just the su-pless, wasti wreck the morals of any franches place, wasti wreck the morals of any franches

done therefore a means and over the common of the common o space within the circle. A pushing feature of M sery's lights in general in that finshes described by se clist of porticular sitters; the same light is oft



their view and shown to the rest. This is not caseal, but is done by inand without crafederacy as no believe to be the withing quite poset in technique of trickery

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our Chester

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Philadron 19th When mentioning pressured or disfast down the engineering time robuster set. Cast down the engineering time robuster set, with our robt lates. It glouged into the author to the will be robt lates. It glouged into the cast in the set interaction. The properties of the cast in the set interaction. The properties of the cast in the cast of the cast in the cast was not in base at to the cast in the cast was not in base at to the cast in the cast was not in base at to the cast in the cast was not in base at to the cast that case was not in base at to the cast the cast was not to base at to the cast the cast was not to base at to the cast to the cast was not to be cast to the cast was not to the cast of the cast of the cast to cast of the cast of the cast to cast of the cast the the

in frust is one of the protein temperabilities connected with the gase. A fact, fror in the interior of settine, evant decided have been equally effective; by also, we sak "whose fixed "the position of the table raise on almost any answer that might be given. And whether we assume a head or a fact, the evening of manipointies interiors difficulties which. I think, are Mail red by assuming that the phospherecent pie-reducing the temperature of the purpose. They certifiely didn't limitation is to re-

certificity (dech lifections is to see the least of the character of the least of t

agets, and after which we got red light for a second investing. Despite its great distange from Margary after the drift chapace, we flowed the left wins new come away and lying sin the floor, with the rest of the structure erect. The access that half the angleinum on the corer had apprentity been tern cet, with spiterning of the wood. It

containing to the work of the contraction sever work on flar, where the conditions were qualit on minimizery; the destruction again or minimizery; the refereint, in two contained is several on brought or the contraction of the contraction of

the of thing it, unless it be held from the other side, at the issue.

The San, and the side of the other side, at the day, and we were most unwising to have been still side day, and we were most unwising to have been still side day the incident dust the place of liness always was need against a medium, and that we would sid. We are assuit to be a supplementation, and that we would still be a manifely always the side of the side of the side of the side of the less was to be side of the side of

Self-the made may core, denoting the menter approxime, when the bidged bonds had topolory, a beame in the hot bounds will arraed, fact, the mades upor reced, in as failube to the mand of the bound would be emissional of super-correct servine of the filespe that the Committee has invented, giving the purpolic posconstructively to invented in a restore nearwealther in freed.

na Margery, Ried, Dr. Orsened, "Ruth," Mrs. Mrs. Despit, "does," Dr. McPespill, Mrzgery. With such San-Chandine silive serroscale, land-cuttle was perdiffer; no fast entirel was utrasped other than of Marger,

1 was stiting with spread legs, a salie leg in sharp cutted with such blight. It because relided to see the!

e collect with each thigh. It because orificial to see that the table was stranged to this, was, then the medium in the delected of the delected of the delected of the label of the delected of the delected of the delected in the delected of the delected of the delected of the delected in the delected of the delected



be opposited which has been on the table for smalling platfage—propose, which, etc.—we have been by a large making, make epistating that the magainst and placed work or a finished on or or to be provided by the provided by

the deels are opered to schedule the theory that the imposes originated within the table. When I pure it from play, it specify capabed the public worked at carry of irregulate appearance of in the force—energy of irregulate appearance of in the force—energy of irregulate appearance.

erray or measure apparatus of it the shot-curryling right side signature from the shot-curry-Thin bridget that repented when PH was zershent, or May 18th, The Jorde van Marpery, 19t. Cardington, "Beith," Blot, "Jenes," Dr. McIrospill, Margery: again the theory sitters were surrounded, and this time we had for control as well as load. transpir volte. We get d' militaneus movement from the ukubie and the reales, both munistakable, at widely separate potate. (ii) May 15th, the circle included Margery, 191, 'Mrs. Gays,' "Smith," 'Diesy,' De. Charrington, "Jones,' De. Frince, Margery, Gays, by the way, is a nerven whose

the in firmal scientific research has given birs a place of West William. More a place of West's William with small recogilitie, and the same may be said of Marginty harvesterated wither; they also by the Datest the nestice-tip satts with which is insured. We may experimentally receive of shifts, both associative and interference. The place was the same and the property of the place of the place of the place of the basisting deep surface. The place for basisting deep surface.

The station was on its color unfor the table, pitting, it was not the size of the five bull, it was not the five Principles area. He had not to be a five of the five Principles area. He had not to be a five of the five of

in question 29 existences of extents, and we had to see the theories generated for a messet of the high, while the contract of the contract of the high special contract which I and coloned I must set have lime for his which I and coloned I must set have lime for his mark have effect him see contract of the contract of the mark have effect him as the contract of the contract have effect him as the contract of the contract have effect him as the contract of the contract of

the independence of the date smallestering.

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The alread independent sounds heard included these dear whiches and fire windowed below. By a system of stime stands we established that, while tokedy save FH and I heard them all, each of them, was heard by some third section. The judgment of all abters except (Dashward on page 122)

Making a Monument Out of a Mountain Stone Mountain Memorial—Greatest Work of Sculpture in History



d of General Lee, with the sculpter, All follows in the story of the farthe state of the s on as the "Stone Mountain Conse notive Neucrial," and it is bested in the Nutr of Georgia, 16 miles from Affanta. re describing this unique work in any of its details, a named the questions; What is State Mountain? and what is this year muck which is helper our family nd, what is this vise work which is being our being the life face as a motorrial for endison ages to come Stone Meunicia is a vise block or eliff of consumnity se and me-built ralles in length, which rises from valley to a height, throughout its central parties, of SE feet above the greend. For several hundred feet this tenceing and absolutely will wall rises sementicularly and then for the few hundred feet remaining, curves over backward gradually to its highest point. For thfirst the persectal is intertwied not amendy for present but for a future influte to the uses who fought the numbers contributely, the first step was to de-raise the quality of the grantly and whether it posbread sufficient denoisity to make cetain that it would stand in all its convent outline for computing A careful exaudatelism of the some way, there fore, made to a depth of ore feet from its surface; and the State prologist, after thorough analysis, repor that its erosist takes place at the rate of only one line in 100,000 years. The granite is in color a very beautiful plan-gray with a wight rive time, and although e, of course, harder, it cats like markle for Home Mountain Constantanting Mer

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it will be in tall relief.

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to be from above, not from below.

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See and to the size of the section of the self-life of the section of the section



green to its present magnificent properties from a

The projector, specially designed for the purpose, with which the drawing of the central group was thrown upon the mountain



The perpendicular face of Stone Mountain, Self St. Mgh, wit Lee, Davin and Jackson, showin as they will appear what the work in perspected



Delliers, natpended in chairs, colling out the last of General Los, 600 fact above the op-

tions in region to an income playing By made by walking net and lighting up in these landsome carried in method taken much thus At and at all rividios. Therefore where laws place constructed for tenants a special laws, contrast for exacting tenants and the contrast of tenants and the contrast of tenants and the contrast of tenants and t

The special car that takes the track-walker out of the turnel and does his work better than he could do it blaces?

theretakly so that every detail maily our observed. Behind the freeze on the deck of the our are as and workness stand. The offe as which the officials and workness stand. The offi-

carried to its proper place and deposited to await Transfer to the proper pair an expension of aver.

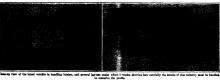
So efficiently have operations love weeked out at this arrest until that \$6 per cent of the lamber received in being put to productive out. The chair five per cent and for cruthing. Butk, sentions and low grade pieces are utilized as fast to provide operating power, so that so part of the tree falls to fast useful application.

Increasing the Potato Yield THAT two crops of potatoes cut be I prosen where only one grow before has been above, by a discovery made by Profemer J. T. Rom of the University of Childrenia. The difficulty in section Collingia. The differity is nection where two crips are otherwise possible has been that the seed printers from the feet crop must be recovered there or from mouths before plenting if they are to

person readily.

Professor Boss has fruited that if the need posturous are cut up in the must wary for placeting out then dispect lists a week solution of mittensy of soils. For from twee saturage or entrine or scan ter reach thirty substant to an hour a short time helice they are just little the ground, they will spruct an quickly an ecosmon seed. The economy feetilizer grade of attract of seek, cut be used at the rate of three the

sods celt be used at the rape of water, and a built pounds to ten guillens of water, and as the solution may be used repeatedly the cost is very small. In an experience started "February 23, 1803, seed potation treated by this method cause up quickly and gave practically a 100 per over stand to April 8, while universed seed come up much more slowly and did not show a ful stand until April 21, nearly three weeks later. It was front that the treatment was person unless the taken were rat before disclar in the suitable. Resides and ling the points grower to use his early crop p to plant a full crup and tiess get two crups in up- ye



after frame with lamps the light of which is es-ted against the citting, so that there is a high rare of brightness on this important part of the set. The inter-part of the marking-contains the rary bettery, tools, measuring internagents and all other things which are necessary to make the work early). The tunor-inspection cut, we are influenced, come into quite general use on the German reli-ts, and it looks like something that relight positivity tated on our own lines.

ing Lumber in a Hurry

VATION and predoction prin-which have resulted in the actually being able to deliver orbile manufacturers emple cturer bisself can be-Jackson, Miss., plant of the at supplies most of the hading tile algipments. A con-ler silike to the lumbs ally decreases the excris haist and care

provides word, when all inverted light U. The marchine, which severes to wrating gover trees a third rail, in rea of the lamber pile matif the inverted U completely over it. The Fours man store the body is done man store the body in the lamber side. By

ing to grades. As his particular grade comes to each sector he piles it up alongstic him. When his pile has grown to sufficient also, the holes and embryor pick in grows to efficient now, are more rear charges you as input after the many to be manufactured. The me-chine is 16 feet long and 25 feet wide, its runs on a track 30 feet wide, as does the transfer can. It hashs as though it were capable of before applied to many other industries than the one in which it printented



The latest design in set microis for eccentrating the energy of the solar rediction and making it available to be marked work

Four carinda of tun hyster on in unboded at one time on to a meeting hills, where it is natived accordon the ways land, Producer Rose believes that the on the wars land, Professor Rest believes that the new treatment will enable gassess to statute this early crop still carlier than at provent, and then ga-the benefit of the higher prices that usually present for early protoces. It may be entirely possible, he size, to notice imperitant points filters like New Jersey, Vin-gitia, the 'developes, Provide and Cultivatio Indocessactil of the more methers. States, from which the

Another Sun-Power Furnace A THEMPT'S to harness the best of the A sen and make it do the daily tasks of the human race are nothing new. The anneved photographs illustrate the latest, and size rather more prostains in this feld. Marris Revens, Jr. of San Franchise, in the inventor of this curious combination. of multiple mirrors employed to concepof the property of the control of th at regardly execute, whether the separate adverse he kidsed to in a frield name bels as at the left, or simply brought to gether in proper relation on at the right gether in proper received on at the case. The inventor claims a trasperature of 18,000 degrees of the forus of his mirror. No statement is made as to the finking in which he recovers and applies the energy this concentrated. We take that he follows the current maps: in edge-formers dreign by lawring it hast and set up directation in a body of oil.

The British-Amer / ican Cup Contest

An International Trophy Which Prom ises to Rival the America's Cup in Interest

of course that which his been held at intervals during the part 20 to are the the Apprica a cap. Ninc this most immore of not a trophy of Course and It was hatched over to the New York York tiets or a run to in our tended for In interactional cases between suchts of large when there have been to have then I I offerte on e part of littles was been a to win it lead the last four of these basing less made in Mr Thomas Lincon to look as through our that personaling under a pieting conditions the chances of winning the "Assertes a cap are to small to justify the great expense and treater of smalls region. I returnity the laterest in international contribing him loop test ferred from the hig of and Ti-ferrers to the small beats of what is known as the 4's meter to These as developed ander the intermediated poliare of about the same sire and quest are the forecast knocked out of the early search of the present century. In alternation that will rest from 18 to 24 feet in heach on the

Suferline with about T test of beam as deaft of sizes 5 feet and a single-ensets of 8001 to 8001 pounds: the sail area being 200 separy fort or seprething less. otional competition in the days of the 90-feetry was a rich man a spect, the of these vactits running to reverse issuatred thousand delicer. Today is never the

of town values restore Toda; however the most of 10th saffing has become greatly on particularly in the waster classes. See it epite of the cent increase in the cost of uniterials and labor the building and so ing of vis series leads in mor hereal branch and the take of manderate triests House, in stead of present day inperturband contests resulting in building of two or time beats of which two only are selected the six matter contests penders such total on both sides of the Atlantic is that of small basis from which clast are whench four proceeding to the clast leagues and four the defenders for the sales of con-tests. This results in a large assume of regular-trophest the painting senses that for the spinitus of the representative beats and hoths for the may must The activity in Asserting pays in Judged from the fact that IN heats are available this maken for the chargeties totals and of these sight the box craft built during the spring of the year have built over more extransion flow we for there are marry 49 of mater leads affect in Reliable waters The international rate under which these little leads are belt was designed to produce a wholesan racing yacks with a week in first strengt for good racing sport and with restrict wholescope in design and strength of strature to provide a good cutsing heat serviceable for man years. Under the old rule which played a prostly cells upon nan-ritar length and mill and designers producte shart and a best of great hear long contrary formers and aft is shallow hade, a deep her with brown outside had believe upd up operation militared—the life is being to predate a half which, wing bested would have a long frequency willing

begin and solvent power is norm an examinate arms of soll The- likelines on a 90 feet w was over 340 Syst beg. on deck to bean with bear's 20 feet of death and switte about his total of lead belief belaw with 10/900 square first of soil short The International rate and our com-America's reposition rule liter to arrange with these engagements. The shellers deep-keet boat gave place in the "Reso-" of the last contest to a wantle modeled a craft so one could high be seen tertational rule has lost the effect of propackta, which have all the policyclities which were noticeable in the house and wood were policialds in the his and seets qualities in which they are before than "Resolute"

bread the outline of It I taken es, we are able to present a peedle dark as, and sall and open plus of the fagazzenk hulk in Lowley of Books to the designs of the Girlaw common



Firmsh of first race of six-or



tent "Madesp" (1956) at Noric's Yard

At first sight sie hoës very much the the teme."Les," a best by the same first which proved to be dibest of the American craft holds for the 1922 copies that there are points of difference as can be seen for the following table.

Length over all ... \$1 ft O to.
Length on L. W. L. .. 22 ft 5 to
Neum extreme ... 6 ft 5 to
Draft ... 6 ft 5 to The first works of races which have agree an held five the British-American cup, two by sen wen by the British and two by the American been wen by the British and two by the America and it is a very suggestive fact that even has less wan the series of races that here had in been waters, America being viccoriess or Scoted and Spritt British in the Solent though this her The first through that come were raised in the fifteen men be symething in kinesishedge of lovel waters, currents, etc., we

makes the difference, together with the far that a rear will prevenuably do bet that a nest was proper and said familia smooth his own people and said familia surroundings. Said this may have some strengthey. Well this may have some thing to do with the metter het rac very ruch. The explication is to be frend in the wider different wind and wave conditions in the Sound and the Solder during the sentener sensor. In the South, as not problems know to their cost, the avera

suchtums know to their cost, the decrease
by "Lass" success halfs are light and storethin, and
during a none will sometimes die out offer
are strong and one promotily be decreased upon to half
deciment and are better and very naturally, his locus
deciments and builders turn out a type of long most
authalas as "spire one travellers" of long most
price one travellers. sulicide to their own pressiting weather confit The English build a boat that is longer over all. The Roughth haift a boat that is image over all, will say like said the board of the like speed in freel levens, and lectures they can depend upon levels becomes, and lectures they can depend upon levels show a latin converge as their small analogous shows a latin converge as their small analogous shows a latin converge as the said of the skines, on the centrary, design their bears for this skines, on the centrary, design their bears for the skines and area, a design addression, and with leaser and area, a design addression, and skines said. The worlds antice is reductively small desirate under The worlds antice in reductively small und abor small acted surface continued in the course of such acted surface continued in the large cell sure means agent. If follows that in American waters the bests can best the British whereas in British waters in British lers where the winds are streng and the are high, the Science, with their greater length and rather finer halls along to better adventure.

Motion Pictures of Atoms

Motion recurres of Atoms

Military abstract planning the first trains of the
Interference of the bellion sizes, traveling at a rate
filter the second than protect the other of the decision
filter abstract were recordly exhibited to the American
Association for the Administration of Science by Proference II D. Hartition of the University of Chicago
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collide of the network of the first colors recovered as of the same size of the copies of the copies which is not because the copies of the copies which is not because the copies of th trens receive at high speed. Alt nactions of an atree is so small the increes of an atom is so much if it would take a million those a million there a million there is not make it is not be made visible and plo graphed by pasting them through tax air strongly lighted from the side. We list a million to coiled by expanding the million of the million to the side. the firing atomic frequents leave it notes tracks of condensed water as Ordinarily the path is straight, but it



Coater) The resolute instruction. Algebra Barr view of the presence unit, in front in the direct research oil neglice Left: The leads of the mit, showing driving man Analysis oil feel to the constation of electric locumotine source

The Oil-Electric Locomotive

A NEW type of electric increasitive, using oil for its fool, the first of its kind ever manufactured in A feel, the first of its kind ever monasserse-con-America, has been expecially designed for switching service and to being given its free personal test by the New York Central in its freight yards. The power-plant equipment consists of a Stochastery-wer oil engine. force expressed occasion at a non-mempower on engage, directly consisted to a 20th/glowning generator. The motive power consists of feat motion, one of which is garred to such of the four axios. The unit has a total weight of 01 tons, all on the drivers.

weight of 00 mm, all on the drivers. There has been extractive extractive registrates during the hast 25 years in the construction of setflyingselfel moirs can be and loconstative using assistant as fact. About the carifornies have been up to non-service during this period and most of them are still operating, in order to take advertage of a love-prior find in the finite-state of the setflying of the contractive conduction registra, on arrangement was notice to build an engine designed for the use of first oil and having the characteristics of speed and weight that would be suftable for its use in a locusation. The complete unit is, therefore, a combination of pieces of apparatus till of which are well tried and whom combination pro-

or with the wife the late of the economy which is far in ofenance of anything that can be attained by the steels Seconditie. The located has been in use in the Parick of the olleman feature at Philipathan, N. J., for about four mention The princip unit is a six-cylinder engine designed to barn fort all and having the features of the well-known Price system of direct find injection. This system

olds the use of high pressure injection and also offices a reduction in weight, an improvement in me-chanical efficiency and an increased singuistry and reductivity. The fact is injected into the various cylinremedity. The tast is injected into the various ders through a distributor by means of a sing tag plumpertype pump. The indvisation system is of the continuous filtration type by means of which the oil is returned.

from a crask over thewart as oil filter from a crask cless (libragh as oil discre-before returning to the system made. All parts of the cylinders, cylinder-leads and combustion charibees are water couled by means of a thermostically controlled water supply. The water from permitted water support. He was reclinate these water jurishes passes to a reclination sended on the poof and a thermsetted substates an even incaperature reportless in register conditions. Entitless fuel call in register conditions. he carried for 45 hours' outlineses switchpoles of the exhaust is also mounted on

the rest. he tred.

Due to the high eccanery (about 4.65 counts of part oil per brisks heprepower) he engine in free fresh modes which seekers it particularly mightide for serice it cities or in planes where mode in becomes to the highest head of the highest head head of the highest head of the highest head of the highest head head of the highest head of the highest head of the highest head of the highest head head of the highest head head of the highe sheet 20 to 26 cents worth of

oll per hour. The troubal feature of this design is to use of a direct-current generator sup-pling caregit to the minima without in-recting accelerating registrances. This

nutivally reduces the generator valtage with the in-crease in the associal of current drawn by the solver. The speed of the increasities therefore assessablestly increases as the kind is reduced, retropositing to the the is improved mitual. This estimated completed elizitates the possibility of sectioning the generator meters or of stalling the explan The coatrol is so created that the epoting of the theetic by mosting the control lever incomes the en-

the total by disting the estimate invertible con-plan speed and at the same than complime the society field which in turn emergions the patenties field. The patenties current passes through a differentially available arrive field to the dividing matter and before record to the separate varies field leaves the generator voltage in properties to the head. As the inquantity sayed water, the current pushing through the differential wries field in gradually reduced, the generator voltage when the in granulary receiver, her processor weaps unterestively hereeves and speeds up the locatestre. The main entitation of the rective field in familied by a stronge lattery which also supplies control curves. and housestine lights

The Kinetic Atom VIE even by which the paylour even was extellibled

Till dept by alice to turner over me to business. Entertied was business. stress for the abide autilities societies with brown ettles from a deposit of radics; G. He has carri ces such beabardness many there stars, sensetion with surprising and exciting results. But this time in ways servely driving the particles through matter and cutring them on a fluorescent served, as as to we have away had been sentrered or defected from their original path, and by how much. If the steam content of a turben errounded by electrons, at classeaux distance In respecting to their size, the above would be as notice . as a miler system, and the alphu particles could be

tracted to go through it, for the most part, without promptible perturbation. Note of the electrons paints knocked out, and so the stea became lenined; but the mender sixtle particle model take a courty are netter of miner electronics, and model proceed troubled on its way, and it coronaered or came on coolingly close to a central nucleus, of same greater than itself. Nach an occurrence would be compared their rare. Judgits; by the revisible size of the auctors on this theory, it would not sever user often than I in miles on bur shadow-water miles of the The riorganistics of each up recounter, whetever it did owner, are unweater to ordinary and no to speck.

descentery dynamical considerations, it the law of innew square holds good. Accordingly, it was possible o dedger beforekund who would become in all the Birty kinds of collision- if they can be called col-lisions where there is no contact. The law of probahilly could be applied to determine the transfer of excitorings in each direction, and then, by the aid of Crocker's financient size antitio where, on which the solution or finite current by the tapert of the defield sight particles count to seen, nor constituted in any direction by the alease of a given subsigned and theory. The fictive alpha particles regit be seen, the number was central wild connect stricts was established as a reality, and a proof was forthcoming that it exerted t-free, even in the incommission ineighteenhand, as the ille-name suggest of the distance, and it was established

that advanced in a still hold good, over in the hop leady attractions upon a good in the laterier of atom Rubber-Lined Tanks for Carrying Acids

The maps of with it the varies cheated industries has increased to each proportion, that a more efficient method of elépasons is very destroire. It for provide to side concentrated softeric seld In Iron tank cars but dilute suiforto. indirectionic terrate and introductional deranget by shipped in this scatter unless remote the statement in the relative whose, the bank cut is libed with special metal or other and redsting materials. This meet has more been rest. A large rubber restrancy of Alexa, 1990, has de-

reloped a process whereby on acid resist ing rather oversened can be valcazioned to the inside walls of look core as they stand on the track. This process is consilt applicable to http: stationary storage inner sanface of the tank spored at a desired distance mort, propositionately one feet, and ever these members the arid proof Roley is laid down link meting regulate of a rather

reserved when serves which is applied to the surface of the tank allowing the streturing derices to piece the screen and clied on the streets side which statist halds this base centled to the swills of the tepk. Several leaves of special retto possible rather are applied on this have continue executately committee the entire our form of the tank and valuation! thereon rendering the walls of the test absolutely sold great. It is expected that sold of nay wer may be shipped with incomits



ed of lining seld-currying tanks with rubber

fid War, there had been concrived the prochibity of ar aircraft from and on to ships. This idea was not n much publicity at the time, both because nothing to was developed and because the world at large e little accomitted with sirks, would probably have led the lifes as a speines risk to hereus life. But ments were carried out after months of prepara-It many cases before a single flight was under in first cutuyait was a primitive impractical looking ir which would have rivalled the appearance of the "Filtrary" Not only was the appearance of this harden against it, but it was note too safe. "Filtrer" Not only was the appearance of time saning, against it, but it was none too mele. done the World War our name aniation consisted of a very small but intropid acrieus who were dustined to bring to light many surprising uncovations in the art of existion. They were then as new, line officers tailed at their com record to solution date functional of the daty is best shown by the fact that ed of an axiation skip for many years before their from once true; they had undersion many

as well as to an industrable persentance which could not full It is believed that the first airplane carriers were built by the British Navy. They, like our first "car-fer," as it was called, were commend from slight built for an entropy different purpose. The Naval Cultur "Justice." built seem reare before the war as some Vappee," felk some years before the war as an en-perinental electric-propolision skip, was selected for our first sirplene certier. The "Langley," commissional on March 20, 1822, was named after Professor Sagnal. rout Landey, one of the plowers in his concep-By the terms of the Washington Trenty for the little ation of News Artmosents, our Navy one belle airto a total of IXUEO year, a part of which has already been subbritted. Two battle cruders were sared to own transvise. Two terms remains were same to this country by allowing them in be converted into air-craft carriers. These wasels have a displacement of \$2,000 total sect. It is important that this country complete the quota of carriers allered in order to have a well behaved first ready to meet any possible enemy on even terms. For without any deals that basis on even secured over ready to user they possess enough on even terms. For without any deals that antice which is indexes in artistion equipment will be at a our dissevatings when extenting bestle. The "Langles" is 54) feet lang and looks every inch of it on account of her long flying deck. She is 65 feet wide. The figing deck extremes nearly the full length of the skip and is successful on lattice-work steel of the Map was in repperatus on discovering a formers on each offer. Ground personnel to necess for rigging the foliag deck arresting year as well as to needst the player. In order to have then at hand

a desired, and he able to clear the deck the figure

and existert, creins to the cioneer labors of specialises

A Landing-Field That Goes to Sea The nets are were free fact mide, made of steel in ne nets are seen tres part was, hade it over it sou bone and rupe in others. When rigged for one the re-vertical and rund about three-fest above the desi are vertical and south shout there thet show the desir. The masts are of exprais legs bound winn the decil is clear for fighter. This is amountabled by the upper to induce the mine the decil legs and the should be decilied as the should be decilied from the finite type of estapoirt for finite should be expected from the figure should be decilied from the should be decilied from more lack, even before the beginning of the

are operated by sir which artuates air phones, wi more a creative at a high race of speed, and the rection is restricted by a palley connected to a carries which moves a truck on the fighty deck. The cur is accelerated to 51 gilles our hour is a consequen-The care short disease, and then evoped voldenly by a breke at the end of the trafk. This releases the plane. Consing below the fights deck we find many unique feature in the arrangements for the service of the plane. In the former part of the skip is a time planes. In the treated part of the stip is a time coupling excipped meetings shop for the regular or means facture of sampling required for a plane or a ship in connection with planes. An adjust of this can instru-ment rooms containing small perchain latter and facili-ties. ment room entrivining small precision latter and facilities for realing or requiring most instruments used on a plane. Before the trackine step are commodities store rooms for currying all stead fiftings, instruments and material used in require to observe, in addition to

than that they were to wape in actual worther—those against the electronic of nature rather than applies an aftern of known strength and enforcemen. That they wan was due to the faith in their weapon of warfare ships' equipment.
Delow the well deck there are four large alsy storage holds, appreciated by 40 feet by 40 feet and 30 feet deep. To disassembling the planes, it would not be difficult to some 50 planes in each of these holds on one level. Ontractly planes are carried with only the outer section of the wings disassembled. Each hold will in this mapping generalization to plants.

Forward of the forestest ultraines stoware hold there are two provides everage units emodding free the inner (double) between of the skip, a few feet above the keet, to the main dock level. These tasks will half 125,000 gailean such. They are syspensed from all outranger graces need. They are specimen you as one but with other comparisants by mid spaces forward under and short of them. These comparisants under and obdit the newline tools are kept filled with fresh water as an invaluable. A slight major pressure of oth water as an invaluable. center in kept on the tank at all three to present the tenne of gas as vaper into the attemphere. There are course or tape on the time of the stranghere. There are except of the as waper that the attemption. There are several gaveline extitions on the main devic, including one set for foreign simplicine that up in the effect of the skip. There are also three abrotate treiting stations

on the firthe deck on the firing deck.

Not only down the "Lengthy" earry planes, but it also has all facilities for fighting with them when percentry.

A reposite yours for storving twenty-fore bropolous it founds in a large hold below the natio forth. This record entities also two air compresses for sharping torpe-dues or firing minopills, elevator medication, warbani-locker for torpols, subsaids, heath streage, gree cal-puse news and lubricating oil train and pussips. By messa of the inter, high-footing oil may be puroped to real stations on the main dock or to the flying deck. for handling planes from the helds and shifting them to different locations on the main deck or litting the on to the elevator there are two crosses transling

to and our area

ne mie duty is ie a special sta ed with local steam

eprisingly accoun Besides being equip pered for reconsulant graphic farilities on heart. Probably the most val-service which this inherences and the three expert service which this laboratory and the three expert; prographers give to the slop constant in the narripictures which they take of every landing made on dwith an utilizacide bless. The negative is develop printed and skown by the machines on boxed, showing down the speed of the projector, every detection of the flight is accounted and an innivitation on the name of our publics.

of the Eight is antherson.

In order to provide the last word in connectabilities. In order to provide the last word in connectabilities cannot between the ship and planes are provided. The ratho applicates in connectabilities complete and the provided and the rathous provided to complete and the provided of the planes and a thington receiving and provide for such connectabilities and the provided of the planes and a thington receiving and provided for such connectabilities with the planes. consummication with the planes. Also at the stern of the ship provides some as the storm of the skip provides accessionistics of corrier pignoses for the case of which two spec-tralized pignos incopers are antigand. Let us integrate for a numeral that we are privi-te witness a firing cubilities on the "Langley," cours on benefit and are second to the fright spec-trems of a helder near the areain pign, or possible means of a helder near the areain pign, or possible many get a ride on the alwance. If we pay the ne-ptipe we will notice unto be testing from a fuzzed that after of the side. A server of water will be or

and part of the desired. If we get the desired for the of the desired of the desi

their hutch clience bringing on a trail of discourant

tracks emponded before the fixing deck. Two Modern Medicine and the Tropics

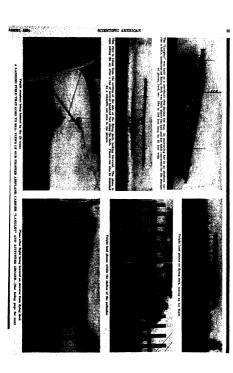
creates to be a thing to be avoided in in medicine and spatiation who carry on an endless worfare against ladgest life, diet and indifference, in order that this delightful and wholly habitable portion of the public can be made a such place in which a while of the public can be made as and place in which a while these was any got ferrous by necessity o toli in the North. There was a time, say 80 years up, when a Surmey to the trooks suggested police from materia, downtory and other diseases to augustion to meeting. Thanks to such uses so Walter rost can live.

It is to deconstrate this addry that up en igne freet, maintain, governory and other message to governor to investign. Thanks to such uses on Walte ed. Major-Greeni Wood, Greenil Gorgas and others will be well on its may by the time this page is p

se carses of the learniful inhade of the Spanish will be well on its say, for the time this page is point. Marry specialists, them all parts of the chilling below that Mill need in Kingdon, Jamelon, in July for a confe-ction to bellik positions as affected by the classic and nativenessed of the brugies. Psychologis, expension, phylogies and clengths will be properlies from July 20 to Ampatr 81 to discuss the combesting of tropical discusses. For individual case in 10 to Barring, the discusses. For individual case in 10 to Barring, the fain have been practically eliminated Today was can watchy Drovis in Cubs. Ports litten and Jameira with no much sairts as regards health as per con anywhere its confirmal United States of To Jupick 28 to discuss the emissions: as not discuss. Note the factor of the parties of the control of factors of the factor of of Central and South America, postded that reconnable preceptions are taken. The trucks ofer great changes in temperature in and out of the em, and it is resulted Ole to get a good shed chill be walking in the son position to but a first some modify sold entiretial. The trapic and the semi-trapical contribute became more and more each year places in which the our low in sufery

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Our Abrams Investigation-XI

The Treatment End of E. R. A. and a Study of Testimonials and the Oscilloclast

By Austin C. Lexarbows

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cal Populatory at Catherina College and well-known leather and writes on periodicay, in his recent basis cather Carrier's book my, such worth needting, by the way, because of the insight in given may into periodicay of alliments and cares of the peet and provest—and of the figure too, join all verse. Bother some or loss figure too, joy and Verser's Dollege some or loss

a frod formule technique of diagonals and trouverst in valid or and the fact retends that it has made ful me of the technolist. It was only after Space Shrink, the well-known action and needlet, more "The Bone of Wondow" retheir (Person's Manager June 1921) that the Abrana method began to mitraet tetacie stale szci epthosisses, teld what be last seen in the Nan Francisco interactory and etals of Dr. Albert Abrana Shrinki should be credited with giving E. R. A. its liant and exerciscing sayry to the moses, who speak to need in medical research than Jack ey's world near on a thesis draffing with the forest diseaselve or Bule Rethin of Following in the factories of Sinchole, no raceus other seriles and editors have est tributed their quots to K R A Demoture Alexander Marky, Editor of Proposite Mrss. give, but here a visually expected of that

arise, has been a sharely supporter of that cause, develop on the best particles we that they shall be leaded to the third of the particles we that they might be well by the rope of thousands of explosion K. R. A. providence throughout the country for distribution for any state.

of extensions in all not seen to the extension of the control of t

care.

Adde from sever journalists and no sixto, there are others also have contributed to the Attanes florenze and whose masses have given contributed to the Attanes florenze and whose masses have given contributed to make to their writings, so far as the IdDy is constituted. Thus we have No Limon better given yet have for their setting and Association, and Six Mather Thurson of Lincology, Barrier Limon and Lincology and the Consolitor spectrated in 1922 by the international Hattermannian Association in Special Consolitor Special Consolit

switched of the mode and treatment. This constitute is to requested of incorping and monitoristic flow to requested of incorping and monitoristic flow of the mode of the control visit at in the experience is to other excitate solving proper wider in the mode of the control visit at the control visit at the control visit and the control visit at the control visit and the control visit at the control visit and the co

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prevarienter, line sted, superistively, strike a medical testimounus

ipeaking of testimosiuls, here is what Dr. Albert Alcases had to say. This for-simile elipping is subset from "Transactions of the Antiseptic Oth," page 68. (Poblished by E. B. Treat, New York, 1990)

way we should be guiding them to the letters of the matter without wedding through the deter jumple of E. R. A. settebbe Well, we have spage for matrix with the chalcoust. of that committee and his associate. Certainly we have received stacene conjectation from this source, for both derives have given up half a day per work for weeks on end. They have tried to consince us of the existence of the Alegara reactions and their application in disgrawite work. They have made trees for us with exhibitor of our control of the cont full to consinge us of the validity of the Abrust rediction, but the needle brought forth the velocity bytes from the challength of that considere to the effect that with the Abrune apparatus he has been refer, he has been quality to pick our the some bloods This menter that for the same blood speciams this derive and his se-edges have been unable to steam the same forfings, and that, in term, broken that the Alteura diagnosis teripique, in this indeper at least is whelly speeding and without raise. American Counties, cooperating with us in a series of African blood seek, has been make to justify the forestile report of his momentum, it are estimating at least. However, there is still another side to this week, and that is the application of the Abrana mit-

a. zer hiers in hand the reports on \$87 came or torn of from election, through the Abrasas resolving, and all whom these response have been attailyzed to obternable their tree signification, our foliage will be given in the column. Harvers, will one track to active at this time that one are no pure tagernamed with the column to the column that we are not pure tagernamed with the present that the second operation is not by the decise already efforced, i.e.

strengt referred is.

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E. R. A. Their authorisment today in text.

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Bear Mountain Hudson River Brief IF he dispution make a beautiful bridge.

I belge over the Hubba of Base Monthin should be not of the hardward of its type in the world. Also, it is the fune first, its, if we except the Williamshary Bridge over the Base River, Mer Cutt, the Base Monthia Bridge will raise at the upfort, integer, as a supposed to bridge, with price or harder. Except the present corner of the main cubbs (mod that is be a seen as the supposed to bridge and the first or harder. Except the present corner of the main cubbs (mod that is be at a factor with the whole strengtes.

This is the nave reproduced his whole the supposed in the striking house of the size for the size of t

This is the same reproducible when we consider that the striking beauty of the site called leading for the execution of a bridge that should be digathed and beautiful. If such quantities could be secured without particular, it may quantitie to the secured without particular to the experience. And since the conlength of under \$45000000, the follows of pay any attention to the quantities of reduction or such that architectural beauty is as much the less graphy.

execution.

If will be related to the residence that III will be related as the part of th

in the Platanies Insteador Part. If he best politic from a great posted states that the property of the plate politic from a great posted plate politic from a present politic from the plate politic connection streets the Plate have yuganess on best offer of the provent and the plate politic from the plate plate plate politic from the plate plate

and the weekend.

The great length of the central span, and the terminal span and the central span are the central span as the second by the short-terminal span and the span

neutrals side. The tension and state of the support a stagle whre called 17 leabout a face and all support a stagle whre called 17 leabout in diameter. The traffer will be averaged on a stage from, which will previous a control response, 30 feet wide, and two 4-feet prioration. The three will be stiffened by two trasses.

rideratis. The first will be stiffened by two trassers. So fact in Ordy. On the rest but tings will request with the finely littles, Higher, which, when suspended, in the control of the

The Utilization of Volcanic Stamm in Baly TIBE insused device for eventual beingenface that I acceptable the greater of antickal metrican that I acceptable the greater of antickal metricans that I acceptable the greater of antickal metricans that I acceptable to the control of the second of the second of the second of the second of accept. Only it likely has defailed and convention to the second of accept. Only it likely has defailed and convention of accept. Only it likely has defailed and convention of accept. Only it likely has defailed and convention of accept. Only it likely has defailed and convention of accept. Only it likely has defailed and convention of accept. Only it likely has defailed and convention of acceptable to the convention of acceptab

billed at Mellar desperation by salvest stem ("Gegat") have been for emission, but emission, for emission, but emission, but emission, and an emission of the passants, or apalliferation of the passants, or apalliferation of the passants, or apalliferation of the passants of the passant

in the electrical power and for producing electricals have been extend at Leafrichts and tester places. The first actuage to produce power from natural at some ower made in 100 My solar; it is a best super to a fielder and feeding a receipt-ording engine with the producing solar control of the sense of the control of the producing control of the co



The expected methods in being half to passes the highway agreement seek with of the time and electrant the demant and felling of the impact feetile. More stars, 1812 feet, with of flow, 18 feet, height of timeses, 150 flow; sizes height above the river, 112 feet. Hadden River Define at Board Monartain.

was decided to spect, a 200-kilowist task-outcome in the worked with against severa, her ording in four of retraction of the cardine blacks, and the diffusity of relating a good reasons in the woodwoor, on assessin of the contraction of the power sectional shorts, this of the contraction of the power section of the conceptance where therefore construct not not used. The power large power-plans at Landwich was specified in 1904, and complete expendents into subsequences, on-

 our works, and to \$2,000-08,000 for transmission to filters, Placemer, and other rides.
Leaking is the fitture, it appears more than probable that the production of power and obsainable with the sid of antiral steam will not long be entired to Tramay. Altresdy the volcants electrics of Vessytte, Etters, and the behavior of fields (Liperis are being statisted.

include Buls. Her investigations are being pursued in Assertic of the atoms springs of Childrents, Chile and Bulsta: and attention will fourthless be given to stellar fields in Alaska, New Zeuland and expectally Japan, where such volcants manifestations are asserted adeleted from Attern Journal 12, 1921.

Wasps as Engineers

This vanue here not accurate to far in specification as the box, for there are no species in abide in feature is decided using to any restorate, with the excitation which are excitated and featured by additional control of the second cloudy with the issuitabless, the their contains are for abased at the insulations. The most advanced of the insulations. The most advanced of the insulations, the most advanced of the second species, are the messions of the restorate of the restorate of the restorate of the second species, are the messions of the

gotte Fepa, Groccidy, speaking the reasons wast, Froger subjects assisted in most it is below the proach for it will necessives select as below tree, or even brait moder the folion and of a lower oscillating. In the next between the controlling. In the next betweening unitral is solvent, may say with a transled outdrawn of foot, and any still a transled outdrawn of foot, and or youtfur eliminate which is thowardly they and not likely to be reset affected by the controlling of a stable character. (In

warp first clears away any lowe rabbiah and, if necessary, ethicgos the character somewhat. Commenting her work at the tree wir attaches a stall strong encests to report three cells. Both stalk and cells are constructed of the fastilar paper, which in the case of this species, is made of second word scraped from posts or the elended surface of a tree truck, and man firsted with the railtie, which is extremely selication frites hard, and forms an ex-ceedingly mands compound with the filecom-material. The three cells have done marks. Also the three cells, the innext next piners a covering of the paper mate they are not much adherent, but a small strongure to left between them. In some cases there are so asset on sixteen of these paper could, and, as a principle of conserving the socrath of the and and are retring any makage of rain from above, it is very effective. The many next deposits as one in each cell and then proceeds to construct other cells adjusted to the free, ploring an egg in each as it is made. A. the cells increase in number beyond the reperity of the original stalk to export. studies stalk is attached to the roof while over every neithboard reit the dame like covering is entraded to protect in

has eventual to retrease to poster it.

As some as the first regar hatch, the ways
decisis from further cell construction for
the tiam, and demonstrate attention to the years. Sale
of reflects heavy from flowers and inners, perferably
a spitis or reader conceptions. Notitive ties, nor at any
time is ford sinced in cells, for future consumption, as

In the case of female, the course rate to be presented in the case of the case

The Story of Steel—VII

Making the 40 Million Tons of Coke Needed Annually in Our Blast Furnaces

manufacture tions the ore mine to the steri imper, the would the Saletestica of the layer has a socialtude of fighted products such as talls, places, filenams, gies, physics, wire, malls and what not. There for in uset, the blast formers, the converter, and the open August with their alliquely student the steel Hat before meeting on to the ter read be desired to the contribution of manthe fast upon which the blast further depends for its mighty reaction. The large part played by color in realized when we learn that it 1925 (the besider year In the blayer of steel unbits; he less than 40,201,000 lots of order were consessed in the blast furname of the contentration of cool, stal it is the residue which to left after the solutile constituents of the cost have

been drives of. In the early days of the steel industry th green was curried on in what is known as the beetfer oke open-which was obvious in our und was closed with a record reef provided with a the except of the gases. The coal true laid on the flat floor and he attempt who made to revoter the gover, which went to works. In the temperature of Hemitaling one, where it was weight to become weightly elements from the coal, the war a matter of secundary considera-

The partner pulse was upd to new led on in closed returns, beated from in cerulas, the rea befor conflict and its to large gas belders It was inecliable that in the seed in stry the effects of inschools should be directed to the necessary of the cert valuable ig-predicts, and gradently, during the part III years there have been develed various types of color course until a modern furthers of courts work as that room on the adjusting page, togeth with its elaborate in-constant about, Series one of the real substrator and officient stices of our large electronising plant. Net only is it mor resollite to produce a coke personaling the special qualities called for by the Stant formers operator, but

from the gaves which forwards went to water there is now property a whole tes of valuable longereducts, and the greboots in being used on fact both in the overs and in various furnament proughout the sixed plant coke even, such as the Enners installation between Wastrated, has brought about one of the most important ever-nice in the whole maps of steel ure, at employ of fully 30 me cont harin m swared in the together of color as consumed

ith the older and new marketal processes.

In the year 1800 the Chited States Start Corneration suffice of etgianers and works managers to of Bureye, and they finally wiseted the Kraners Crass strative Color Barn as representing the best of the special it operation, and necessarised in their my the erection of 280 courts of this type Ricel Corporation Informs us that the investigation of e by-persiant virte is induced as the SN/MMIGON community In their works also, and that it is probable that at least another Stranger is being used in the Krepper of surface other by-product code mete cooping the

regions steel negative. The Cross Represented to product their them a berwith fliptrated, both is our proportion new team in the locatedized section, is a narrow nectangular character both of this into the locate national discourse will have all non-sec within 6 H index, and located it for Three cross bright of 12 feet, and length of 16 feet. These crosss are arraphied with ht side in on her structure which ay extend for several hundreds of feet . The ones any enters for sensoil littelines of feet. The order are expected from each other in a series of method from in which harmon for on in which berning find gas provides the best necess sary for coking the cut in these prints. Directs he erk such retorn is an individual represent. Stulled to its principles of construction and epocation to the hot

stores which we Mastraini to our articles on the l furner and the spen-baseth furners. In these rages senters the sir for companion is pro-based. The two ends of each corn are glosed with the narrow doors, waled with clay. The hearing gas passes from the gas helder through the find gas melt and into the rivers considered over, and the sir for conjustion is bested opposite each own, and the six for confinction is health on a high temperature by being drawn through the licids chocker-with of the regenerator below. The health air neets the Econolius gave stream at the bear of the vertical fine, when the locating game you are word in the fine. From the top of the vertical fine the het gaves of configuration year through exhibits fluor over the top of the variety fluor and down late the opposite representer. Here they give up a large part

of their heat to the brick checker-work. After this has centioned for always 20 expenses, the first of air and passe is reversed, the fresh air pensing up through the leased elector-with, reversely, and neurality to the to fine all the later except that which (sh degrees Palmenteit) is required to produce the neces-any stack draft. It is impossible, within the limits captern transminist) as required to produce the back-any stack druft. It is impossible, within the limits of tale article, to go face more detail in explaining this varies, and it must entire to say that the flow of the e is automotically received at regular inneresh

is bested evenly throughout the whole bright and length of the core, and a cole produced which is first; that is to see, which will not sharter, and which has sufficient emobiling strength to bear in the blast furnamental extensions had of 1000 trees of the burden over A smidera transfer of heat to the charge of one is the even her best secured by netroving the width of the even with formerly ware about 20 links with as against a present width of 14 incine.

Our full-page libearmine gives an excellent idea of the peteral layout of an up-to-date plant. Out brought to or relieved case to divining this begins A, as shown in the right-hand foreground of the Statistics. From the honore it is fed on to so inclined belt, which In second extension it on to a long 36-lack belt on which is reasoned to the top of the levelor building &

where out it insists up to pass through a lighted acres, and have at the same time the prime, such as sinte, him of inea, etc., in reserved. From the bettett of the breakers a Milarth bett im un tertine of 20 degrees, carries the accessed coal to a transfer tower, and there it means over stacker 3-back belt, to the lead home above the large and basine it, which has a capacity of 1976 term and serves a complete hattery of cross. Holess the business and travellag on the roof of the owns is a larry, outsiding few considered logices R. The betters of these larguer register with a series of four below in the top of each resets. through which the exact smooth of eval to fill the

ment is, which contact the full length of the of reman, the interpretative of the gas being any of comman, the interpretation of the gas being any the gas is specially distinct and contents. Happen common being beinged of the rest and contents, Happen and here is not expected to the contents of the real here is to exceed as 12th degrees Fallerments, and here is no expected to the produced produced to sentence and the content of the contents of the the sentence and the translation of the contents of the sentence and of the translation which is the in the own separates building. In an expectation, the in the corn separates building.

When the colony of no own is conspitated, the anti-diors are removed and the coal is idealized by named of a large, powerful, electrically reperted modular lawars as the "posted", within it monated on tracks remaining perallel with the owner. The pushting is done by a horizontal large description of the colony of the vertical plate, whose serves is slightly has in the traches of the cross section of the reduct. As the recolor has of cales energing, it this lobs a quantitieg our R which has described serves constant as full charge. I

little electric angine now cross the our into the quench has beene J. where sprays of water fal-upen the coke, and coul it off. The coke is then discharged through the side of the our to an inclined coke wharf K, from which it falls on to a coke conveyor be and ultimately finds to way to the char ing leggers of the blast furnerse.
In soldlies to the ter and six Equal property in the collecting and markets, a harsher of the valuable hy-products, including brand are recovered after the ma miers the

p-product house, an adequate descript whose plant and processes would be a separate chapter. As showing the great saving achiby the substitution of the hy-product for the besides own, musicier the following facts. In the besides type about 60 per rest by weight of the oral is re-

over; by the hy-product type about 16 per cont. The 12 blast factores at Gary contrans some \$600 tens of color per day, and to preduce this about 8000 tens of rose are award in the overa. If behive over were rebellisted for the by-preduct over at Gury, it can be realised that the con-expensed duly would be excensualy to creard. The amual saving, indeed, he exceeded 2,000,000 tons of each. And b this must be added the saving to the revelants recovered from the solution of

elitratitis of the cool, which are entihad in the besides coons, being discharged into the air. The hyperdust plant or Gary fature one of the good presting developments in this great colubbiation in the prest colubbiation in the great column and the column a est that expenses more surplantically the highly loged technique of the United States steel indust close with the following analysis of res sized in one of the latest types of Koppers on

kal per own per dur. Total cole yiejd—per tea of coal... Formare may visid—per tea of coal...

Partners on the pitch—see me of even. Still per east Desiration and pitch—see me of even. 60 bit or ext. Plants part pitch—see me of even. 61 bits per pitch—see me of even. 11320 m. 1120 m.

The Assault on Mount Everest

General Bruce Concludes His Account of the 27,000-Foot Climb of 1922

the Expediton of 100% This was a recutes sent out to class Month. They were not sent out to class Month Month Everent but he mountains the mountain from every direction and discours which was the easiest way up. For it was quite certain that only by the easiest way possible—and only if there were at way-would the resent over he reacted. In the Almount inch for the most difficult was an exception. but with Mongo: Kierest it is very different. The exhereties unalismed four the differents of locations in ragh oxygen at the great helpfule to so feerful that

only by a way that entails the least pro-sible exection out the secural in reached. Hence the secondly for systelling the first on is throughly properling the actain. This was all the more neceswith Section po. hipropens so far had been within 60 calles of Mount Reviews. During lift! this profitalisates was most thoroughly carried out and ample data was brought look on which to make the fire the IUCZ amount. The world wa, of course, that the attroupt ended fallure but it was a girriess fallure and Brigadier-General flot C. G. littlers. CB, M.V.O., is a work certified "The Assailt en Mount Everest 1827 exploites mig. This samplume book published by Letposts, Greet & Co., goes on the abrill as the previous volume and me read on the backs "Executationary," "Assembly," and we hope there will be a third volume and we sope there will us a light weather its souths now powed. This will make a great tributy of name compared of nature's iset and must precious treasure. Effect and burson life next be succided before the end can be attained, and it arnet for an Englishmen and especially an Eng-lish mountain climber does not know the word fallers-surpress postponed perhaps, but in the stall seat. Mosar Konsut most

sted in geography and mountain climbing the question naturally presents itself on to "what in the pre." Mr Francis Yengtenburd it ids invoduction converthe question in proeral retus as follows: These repealed efforts to reach the senselt of the world's highest mountain have sireofy roat leasan life. They have also cost seach physical parts, farigue, and disconduct to the climbers. They have been very expensive. And there is not the ever being obtained—not un ounce of gold land upon which find or unterlat could be great. What, then, is the good of it sil? Whe will begen in the least even if the climbers do eventually get There are questions which are the too? still being continued; unterline, so I had better will as on trains to reske as state but is the good of elimiting

To those who are not mechally inter-

"The poor excesses gove to its thornwood Marriedge of our corn capacities. Its trying with all our saight and with all our tains to effect the highest our south case were an our raise to either our pagers we maily our do. So one can say for certain yet. ther we can or carged much the sunnel. We can not know till we tri. But if—as seems much more probable over than it did ton your age—my can beach the restaint, we shall know that we not capable of more than we led supposed. And this knowledge of our appeciates will be very reducted in an own different have not much invested of their capacity for eliabling resultains greatly invessed. More equally no eliabling has been raised. They new those that they can do what 40 years ago they did not deep in the

ert possible. And if they reach the scenari of Mount wered, the standard of achievement will be still per raised, and two who had, so for, nower chaught attempting the lower peaks of the Hinniana, will mpring the sweet place of the Hitchings, will think there are freely as they have elimb medic

in Switzerlend," continues Sir Francis Younghashand.
"And what then? What is the good of that? The poof of that is that a whole new enjhusem in life will per or than is that it was her enjoyment in the war be opened up. And enjoyment of the be, after all the rad of life. We do not live to not and make notice We out and make many to be able to enjoy life. were of as know from actual extendence that he obtain water of as their lives intend expendence that by climb-ing a mountain we can get some of the finest expenses there is to be land. We the low-larg curvature against a secutation, justing our meetin, our more, our skill, augusts the studied difficulties the securital presents, and dealing that we can develop the opinic within up to

That he a glarites to

The closest photograph put made of the world's highest more

in their end a real time to the existraces when it feer per plays reager.
The first field is not all. The treeting with the most table extern us less the meetings. For the moment per may be utterly extensived mad only too thundred to be able to harry book to more congressed regions. Yet, all and the steen, we also resignate regions. Let, and the steen, we shall gentiately get to love the meanath for the very fact that she has formed the utmost out of as lifted to fact for one predons measure high above our crelinary 10s, and shown to boarty of an australity, power, and partiy we should have more known if we had not fored the megatalt squarely und struggly with her.

This, that, is the good to be obtained from elimbina "This flats, is one proof in an extractor areas commany Meets? Develor. Must test will have to take an trust that there is this cost. Fut most of the best plung in life we have to take an trust at fast till we have greated them for extractors. So I would say readen of the look first treatfully to accept it from the Everet.

Sinders that there is good in elimbing gree (for the risks they have run and the buhave coduced are unpile enough peopl of the full is in them), and then to go and test it for these in the Simulator, if possible, or if not, in the the Beckles, the Andre, wherever high per

We will now refer to the book no was now report to the book. I has votage of blass the naturality of the estapendous claims is well the height of 27,000 feet was reached, thus eclipsi all previous records. The archiverants of Maho Narion, Roserwell and Machaed is the first claim party, and of Pinch and Geoffmy Ream in the new

> physique and courning person of on soce, and demanded very perfect ory neces, and commanded trey person organi-necies on the part of the isoder of the sequelities. The use of oxygen appearable was seriously tested for the firefittee and profitted results of treat activities for portanes. A third great climb later to the senson was unfortunately inter the territie avalances which one the party som after the start, rethe party son other the start, resulting in the said duth of sevenic of the Tibeau porters. All the servaluements for the supporters and porters, the negotia-tions with the Tibeau analogistic ori route, the great Base Camp and in-mailty camps higher up the moustain twisted an enemous amount of work, and the stimes that it is a support of and the stimes that it is a support of and the stimes that it is a support of the party of the contracting of the party of the part and the basest next in extratorous the firstline and sistacles; those are describe by General Brezo, and provide most so tertaining reading. The photographs are if possible, even more wenderful that those in the previous work and the sage of the creatry has been the wood in the light of the latest or We shall be greatly interested in chron-leting the third supedition's results as soon as they are available for publication.

EE rulture of tiesees conside the bod The rainer of tissue conside the way first throwing sens light at the conditions requisite for the unfortienties and differ-entiation of cells. B. G. Harrison (1907) was the first to device a successful nethod by which the growth of sensity cells in calture could be followed under the uncreacope, and he was able to decometrate the congrowth of nerve-floors from the central newors tissue of the frog. Bar-rows (1971), after medifying the tech-nique, cultivated nervous these, hart-cells, and nesemblymators issue of the chirk in blood-plasma and embryonic aschick is blood-plants and embryonic on trust, and this testhood has become a well-established means of investigation of cell-growth, fasces from the dog, est, rat-grians-jug and rest hering been succes-tably grown. One strein of connective insus-cells (discoluted) from the chick has been multiplied in cellule in vigor-

has been miningtoned to ceities to vigo-condities the oner like too person that is, for probably some years large of all the of the result is probably some years large of the of the result is proved any ten or the second larged growing personal to the personal to the contract of registar largespared to these height dissipared—the coils forming a tith, residily proving, pulsaring about the property of the personal personal personal personal larges (2016) as become containing about the pro-position of the personal perso various classes from the nones. He find-thelial cells when growing alone remain code and, but no the soldline of connective theme decime acce sets in. Study of the conditions programs on grown and accommendation of the pro-gram the legitisting, but it is evident that a new than investigation of great promise has been opened up, pits alsottle lead also to a knowledge of the factors of the determine showing deep, of the division-tune and a reportion of division, and faulty the complete in-

A Super-Industrious Brick-Making Markins

A NUT entreastic stellar mechan, nown. A fix the accompanying view, will now see 100 outcome bricks per minors. The notifies open the notifies open the notifies open the notifies of the normalization of the number of the normalization of the number of th

concrete country the studies to seek a very both eith review the full studies of misorfield for a brief.

The dataper these withhouse and the target comes down and carrier the record of the country of the studies of the country of the wife, upward, the tauget meeting to with it, and the finished partie to praise et and the helicite curried off, the stan the register. The finish the parties et and the helicite curried off, the stan the country of the stand their parties of the standard of the standard of the finish is requested. A guide has at finish the finish of the standard begins the faith of

an empty pathy in place, and the opention, is reported. A gattle has at the frust of the machine keaps the pathet in proper piles. As the machine operates tracket and a half there is advant, and sight bricks are tracket and time, the braid is by bricking per mixers, and time, the braid is by bricking per mixers. Butterlated that it operates with the precision of a works. Both transper bead has a few the date of a

beet taget which more than 120 penals; the tanger drops with an impact exceeding 2000 penals. The beless are flot, 24 teless bigh, and may be used with or without the "freq." Making Castings Without Sand

A DOM-SOUGHT said to the owner, feating to the house are some of elithrating it and used in sating and be. The is two volution it is not such a sating and be. The is two volution if he can be the said of the said said of the said said of the said

we make the process. Or offered, me has mind made and me the mind of the make the basis of processor transition to make the mind of the basis of processor transition the contributed central of motifact had in alonged from 18 has zerow been asserved the salety as settled. When before the motifact is the make the motifact before the motifact that the motifact is the confinery stand mode.

Secondly accross has been attained in the december Brownity accross has been attained in the december.



single of its operation this ingresses machine turns out 100 concrete. The only labor required in that of feeding the concrete mix to the

sleenly had an avery on \$1000 covelage made in them with the result that not one of the made has had a before the made. The specimen substitute the company of a forced to has been convictly worked out to covey detail it and in Alling positions. A secretary to a description by one an authority in a foundary indexing, the secretal steps and without the convention to a coverage of the secretal steps.

follower: The problem to been to make a very fact one. The problem this is been to make a very fact one of the section of thick to recent with a layer of highly reducing associal, of processor thirdway, a valid this reducing material to proceeds from allowing particulate of the form the exist is absorbed until particulate of the form the exist in a problem of the form the problem of the control of the material and the particulate of the form they are the executing upon the control of the control of the particulation of the particulation of the particulation of the following the existing to the control of the executing upon the control of the world.

In addition, the particulation of the control of the world.

the stope of the cycle on the control of allower completing internationally gathered for the control of the con

ye for from what would be a need autom, on not the secretic of the finished beautification and the secretic of the finished beautification and the secretic of the finished beautification and the secretic of the secretic of

the infrastive surface set the solution manufact subsets around to extended positive manufacts or described positive products of the finest of special positive manufacts of the finest of special positive comes can be set, the two trans of sets of the set of the se

In or over left in the notif is ready to make it measured with a stillable for it to be been determined by the stillable for the stillable

mer hjelter er linn hen in he enricht frau a distant, and hardy, erheiter and in my gend all ay high er med hardy, erheiter and hardy, erheiter and hardy ha

come a matter of housier refractivey coulting, and mate frequent report of reports points in those coulting, when larger work is undertaken. A Subway for Sydney

Quittie the impost work at prosett in owner of one offerties in the encousements in the partnerscane of stratics in the encousements in the partnerscane tenth of the encousements in the partnerscane tenth of the encousement of the encousement of the encousement of the encousement of the tenth of the encousement of the encousement of encouse and the price soften attention will find it in encouse and the encousement of the encousement of encousement of the encousement of the



(65) Belley of these personnes until markins in specific. The mode are manage on a terminis to furthering the national contract. Differ the set of mode over the position in the set of the section of th

Volcanoes or Cosmic Shell-Holes?—II

A Critical Comparison of the Moon Craters with Experimental Splashes

whileh motertal which leave

lly conseing the cruber back the a bloomer. This is first

what would happen shortly after the impact upon the settling of the

By Daniel Moreau Barringer (Contains from our July Intel)

on its surface, ason the great "photo-"

on the Januarisation, and in at named of instances and emaile craters of the same in pro-relating craters. It is rest to note that they fre thr cut late the rist of a neewith a circular die or punch on a minimum model, on effect widels

Deve in get excisinable on unof suicusion which can As already winted, it is not difficult to pick out the cost recent of the luxur croters. These imparts securred as I think, when the surface was solidized ed that befor Erbber to weight and also in color ald tend to final up to the surface of a tool a while the basic ignorus rock of greater weight.

SHAM, While the basic invests rock of greater weight, and datter in role would be beauth and member to a metallic over, if it exists, rotch further removed from the later surface. These sold interest rocks, if I am right in the assessment that the variater of the muon largely composed of rocks of this character (an asse), when pulmerized by the force of into microscopic particles making a rock fug story heavy dictord rock particles or dust).

(excessively many strongs note installers or court, would have the effect input settling upon the surface of the mean of producing a whiche area emplosed superficially of rock from not dissimilar from the sugge one of tens of the above serve-white so-called which surrounds the Ariner center and which tainly for mouths often that Separt covered the tor Stelf and the plain round about for a noise or more. This is an effect which is very similar in attracture to that which we observe in the case of a namele

name, brittlettly reflect statight, an ef-et which can be lest som tipropen a over when the mean to at full bilincope wase me more or at the effect tain photographs, however, show the effect very well. Tycho, Copernicus, Kepine and Artifacelus are good examples. There are to some streaks or sparts of ejected fragthe rock four or dust, which radiate from eed by toleratic action but which we knew cum be produced by the free lously visions impact of an extrastrict mass striking the rocky exact do earth. The effect weight be that of an explosion and the tretr comminated & section of it reduced to the firest constate of mixiridas, would e ect in great jets in all directions or for in great yet in all directions or fly from the point of logaci. In series surpostedly, the mean this a recess survending the mean this is don't world, of course, full vertically the surface with the effect of producing may reflace streaks of white uniterial. In conceptable, of course, that she ex-

of buar croices and the area turnedintely surremaining them. This exceedingly fine and white park their or duct would at

a actually corried solid traffer over the graves state, and was inchedithe material on it was long pro-d in streight lines from the cluter it be referred to as rick super or for ber the effect upon solide atten the world be the same. A proper teristic of these raffant streams. In the control of the control o

Tyche and also to a less returnable at from Coperation, is that they and prings skadows, as do all the projec-

THE theory of imput here very it is in surface, and are connect more annual contents of motive or more of motive or desired or motive or When water spinshes into water

end of the white dust. It is all to imagine here some of this or complusted material rook en immen distances agt a version or one of the MgD is varietie as one of the like of the energy expended. It is always be large in used that the Impart was nortific and, there being no absorption

that the checking up was very sudden just at the secrets of lapset, which would mean networked by crushing to fractionia, and its estificate it may have been that the impacting name possessed such relating or the applicates of the target were mich in to produce at accrete of fooling applicates to make a belief studie with its

bettum filled with hymolite ma-terial which afterwards schilled fate a solid level mass. This may tisks the sleeter of the own

hill in some of the greters. As stated above, many of the langest craters on the own do not above the cratest little or estimates of net minetaries Hopers, it not polerisame agreemen, more effects may have been masked writing to the great age of the cracer. It should also always be botto to gain that air, in the rose of the earth, and vacuum, in the

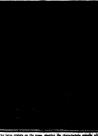
A troth of a second after the

mae of the moon, have their peculiar effect of the kind which we are considering. Luddentelly it is of interest to note th Chart was by authoric water on the creater more made. If it was account If it was pres stated, the relocities of the impacting manner made the lunar crutare must have been far in

of those on earth, as there was no checking by attrosphere. As I pointed out years ago in my page. pointed out years ago in my pi on the Motoer Crater of Aris such was quantities of mine pairerized small grains could be produced by a steam appli-or by any volcanies, it is understand volcanies. It is always be borne in mind th of greatty on the more to coly specially of that of the earth are that there has not been the restet once of an attracepture to respect the forward movement of the ex-tensively flavly divided materia thrown out of the craters in redi-

ant streaks by the force of impacts. Margoret, it is set imparts. Manicore, it is enfound that there has been no water or water de wind ecosion since the croises were mode. This fact must be home in raind when considering the subject fram may single. Evidences of content, as we pader stand it, are not observable on the n

small it, are not observable on the most system. The reason seems to be a size pieces. Remains, as we know it, could be in the pin to be openative until the ord another extricted gravitative force in amongster to the clay pieces which from an amongster relate began to fail. No white it, or relate began to fail. No white it, now force, and, preventably, no wicespares. I find that wone automatores still claim, the hardest despite the option of Jean and other physicians, that there was also despite the option of Jean and other physicians, that there were the most interest and the whost there was water on the most was the whole of the country of the most way water on the most way. this when there was water on the co-nurform. An far as we are able to jo there is not the eligiblest existence water erosion during the period when added creaters were formed. We be that a great many craters have been me wince that time and yet these very old ers have exactly the sec-ing as the more revent or the inference unavoidable



igner has but to sent himself in the muck-up d be has inelately available a resas of viral informa-en that would etherwise have been sequired only her endings work upon the drufting table and which in many cases would have been unsetle

ner. The case the glot we clearly about him? This is prime importance, particularly with the military standard production of the case of t acceptible to the feet and are there any obroom to manipulate the stick to obtain full more-met of the control surfaces and does the stick, in its

others profition, which any part of the plane? In the motive readily accounted for repair and main-tance? Where is the best place to run the gas, oil, and water pipes back from the motor to edr respective table and the motor and distor elector control rode back to their esting fewers? Where is the most set location for the oil train? How et may the light aluminum covering he saged to give the desired close, stream-

e form? as may be readly wheat by the old

A Library of Sand IN the Structural Materials Library of Little Lewis Institute, Chicago, Ill., three is a special "library" consisting of 2000 bottles of sand. It has taken over ten years to make the collection, which is constantly being added to. At the present contains apthe the collection collains specimen-from every little in the Colon and from many foreign constries.

It is claimed that this is the only collec-tion of its kind. The purpose has been to

tion of its time. The purpose has seen to make tests to determine the values for consent and morter work, and to have the flushing on record. In each record are included the source of the specimen, the grading, the afti content, and the results netric tests for organic imperi In many cores morter and exercise trace in a grade, and the records of these are attacked.

scope and Microscope in One THERS has lately been a rectoal of the love of Nature and interest in the phenomena of animal and repetable life which the present generation ap-parently had all bet frappellen. An instrument designed by Carl Zeies, which is bound greatly to facilitate any



Two riors of a domest airc ane which, although made up of institute ment to me just what he has produced on the drawle s, enables the sen

had only to eximites but from to the layered with an opti eye for Nature's benetice. In fact, this is a principle belowing of small discussions on as to be tipe affects a necess of watching distant objects to numification of life, not investigately according to the present removal to the probet for which, by simply satisfying to it a take fitting is a nemental parties the arm was introceed from it ready current in the pocket slear which the telescope and can be used at any poment whosever the litterant studied of the state which is observe small organizate or clear the telephol details on a set improvised with a retarte currented into a microscope. A suitable objective should, of course, he acrowed to the othe fitting. While the original infectors supplifies there or six these the inference produced by its outservies will income a C. Si or 186-feld mag The lower part of the

mapping details on a cert improvised with a retrieve man high. The interester can as well be used for a study of certain sign on the spot, possibly in connec-tion with a special classifer fixed in place of the objec-certies. The tripod of a photographic

A library of sand: Labeled by es of specimens from all over the United States

fitting curries a mighterne ratio with classy springs, which is used as a support either of the object curries or invariantly of small objects to be observed, or obser-ts pointing the instrument directly at spague objects.

This lastre mt has proved a reset efficient and vernatile coeff: for the senare studen: On cotings, it co-plies reclinion and behavioral observations of any kind

for diseast objects, thus lending itself fiswhich no simple magnifying gloss can be brought near the object. The Effect of Insulin on Bodily Proce A CONSISTENCE to a sentenant much by Dr. J. J. H. Marked at the recent Circinsel meeting of the Assertion Assertation for the Advancement of Prisons Insults to being used by the physiologist as a new in

this apparetus. is apparatus. Figure, the related telescone by the ndfiles of leases of variable magnifying powers, can be converted into a magnify

carrery can be made good use of to care counts can be made pool use of he carry the instrument, so that the student may keep both his hunds from for the manipu-lation of the opinal parts of the derice,

great outdoors, this mane combined in strument will render invaluable services

at loose for leistooly examining the har test of scientific exturelyes. when couldned with a special microscope feat in connection with a small lighting

device, is will restitute a loady and efficient table microscope. The fact that the emerimenter's expressed under the nicroscope are seen in the same direction

as actually perferred, without any in decided advantage, and one prouder b

ity gless for eve in connection with user

and the specimen.

Describe its lifest numberation to

168

pents for learning the mechanism of the narr healthy letters bedy A heige arrests of work has been done on the action of insulin on named animals, and the transdicts office of its injection is to lower the blood-super. This core no republic as to give the imprevalent that the large glymentic must be due to changes securiting in bleed itself. Investigation has shown, becomes the the decrease is for to a replit disappearance of suga from the thouse, leading to a secondary removal a sugger from the blood. The cope for the creating a sugar from the blood. The cope for the creating a this "nucleus for separ in the stemas" is obscure; as already in formed in the second animal following restrict with in-oils, contracting with the effect of the diabetic and examination of the requirement can tient does not proval a numbed increase in the copplys tion of nurbinstrates. Instead of plyrages being furned it actually becomes greatly distributed, the reason being no deale, that it is being called upon to preadure givener to take the place of that which has disappeared. It looks, at present, as if the sugar didisappeared. It means at present, as if any support to unionity by bring changed buts some substance bitheric

derted by chemical means. Dr. Marleyd stated that gionds from falses have be feeled to centrally large amounts of insults and their in austituse countries they may prove useful no race un-terial for insulfat manufacture. In this country with its large electrics, the more productive source of incula in the paracrase of cattle and sign.



Coal Piles that Light Themselves

Facts and Fallacies Regarding the Spontaneous Ignition of Stored Bituminous By J. F. Springer

periodetest curvery that coal would five likely and that this trin the record for the ten-appearance of same whose states the ten-appearance of same which at their destination. Has there extended some or loos assertainty. Naturally, a skip and ious annewisitivi. Sciurary, a skip sale its crew that news specied scale could not be see peried to report fact what had occurred. On since, it is possible that so gives assume of reside scrice from this segme became of the pro-voluntary of high steman ten ments receive of the four-violation of hig storage yards for the socials of electric proceeding plants. Today, hereave, socializated inhibits is well-recognized as a true extends fact, and the may in which it comes

Three points seem to be facto: (1) Dimeniarus coni absorbs cargon: 121 this absorption is necessaried by the eveletion of leat, and (3) the formular impres ture produces a further satisfic for expen-Let us imagine a Mg

plie of hitsuizers cont. All threads pile of hitsulators cont.
All through the taute are voids, filed with air, in the interior of

the pile, there will be but fittle tendence for the properties to very

part of the pile and che-where he will suffer ion of surpre beauter

The roygen amounts to one-fifth of the whole,

so that, if we seems

The voids in this

and done, a con-hierable part of the 17 degrees resolds approximately for, staken we represent that the rathering of freelity expected cost is consequenced by the release cupy and the reference of heat, we could hardly exceed ignition as this requires a relatively high temperature. The circulation which results from absorption track in lower the temperature. However, it across to be very true that an earl in heated us. Its connects for except is continuely solved to. There is, precedingly, a rest A consideration of this point per upon circulation. A commission of this point per-nurse up to local that a considering of conditions in becoming to bring about the result that the tempera-ture increases to the ignition point. Generally, it is

rain at beather for basin the olle where circulation is

and sted bee little by the relatively law temperature of

missible height of the pile and the permissible wid of the base may be warded with the coal and in rots quester of external quadricus. A height of twelve it is probably note under ordinary deconstances, and bese of ten or twelve feet,

It is turber curious that playing a street of we on a pile burning down in the interior is not an entitiely good remedy. The contricted form of contract camp pass returns, the estimated form of contrastion, upon the horder of a pile beaut to promote the formation of other over and perhaps around the fire. This acts as an ambrella, diverting the downward-percenting water away from the series of combustion. The ap-proved renear is to dig out the affected cost. This growed remerly in to dig out the affected cost. This near may be promptly form to it may be steem no the growns and subjected to a stream of water. It, however, the coal is started to a nanorece basis and it is possible to effect subtanegance as will, these manuscript the fire and its surroundings in the pile may be drawned. Across est-tered to the coal of the coal of the coal of the proposed in water to the coal of the c

remed to II. The case of the United States hern mentioned. the Underground

Ballways of London. At Lot's Board, they pro-tified a steel tank of circular plan, capable of subsperging 35,000 tons

lar case is that of the plant furnerly owned by the Omaka Electric light & Power One-party, at Onalia. No-branks. This concern wided men't with a great concrete pit where it is provided that \$500 ties of roal may be subserved. The present owners write that this pit is alread a necessity because of the kind of coal used. The Do-queste Light Coupeny of Pittsburgh some years ago Constructed an energous basis lized with concrete. The sign gree is 150 by 800 feet, and the depth is 15

The plan area is 100 by 800 feet, and the dopth is 25 feet. The horizon is fieth, that in the dates are from feetlers are in an angle of 60 feeters. Here a great body of each like affecting of a new time. On a statustly desire to keep track of conditions, when large give are exployed to effecting strack, when large give are exployed to effecting strack, Farbaya the best tilting to do entire such circumstances in to keep continued watch over the temperatures for downs in the Old. This may be date by Canel, provided for a eventurable total of set storage. Ballmode, power companies, and this premate developing, but the loss temperature of eans of vertical steel takes kept in position of suitable nervals. The leaver portices may be provided with mercula heles. The bottom in open and the apper

if then the tipe the same and the feet above the mand-many level of the top of the pile. The spen top taxy be closed by a ping of waste or by a thread-ed mp. Under these cirszces, 21 will

lemperature. A metal red may be kept continually in the take. Dum with-

not only in age entirestly. If the OLE. Due with contrastig on red on the old the late the lower contrastig on the old making the load state the lower extent. On an around districtories are the six works. On an around districtories are the six works the around an around a six works are the six and may find of the trapports on six the six and may find of the trapports, and the par-nel in the soft sarrow pairs. (I) send sixting an one in a six and sarrow pairs. (I) send sixting an one of the six and sarrow pairs. (I) send sixting an office of the six and sarrow pairs. (I) send sixting and (I) all send sarrow pairs. (I) send sixting and (I) the six and sarrow pairs. (I) send sixting and (I) the sixting are the sixting and in contrast, (I) the sixting are the sixting and in contrast (I) the sixting are the sixting and the sixting and (I) the sixting are the sixting and the sixting are sixting and the sixting are the sixting and the sixting (I) the sixting are the sixting and the sixting are the sixting and office are the sixting and the sixting are the sixting are the sixting are the sixting and the sixting are the sixting are the sixting and the sixting and the sixting are the sixting are the sixting are the sixting and the sixting are the sixting are the sixting are the sixting ar



the external air that energy-area letters will be Spotianess indices is relay recognized as a grin faction on the making in relay recognized as a grin fact that must be regarded with in the industrial world Authorite and given to make. But himshops and he very subject to automatic firing. So real is the damps that the United Nation Government, when con-struction the great out dense at the becaused of the

large mercy of bittaribean coal are often at con-

mile pales to take necourse to present self-outs

ert on that is also reconsidy concentrate. It as

water provides against even a beginning of

that it is all absorbed, the resulting four-fifthe of altrogra will have to ital spaces. Generality, this gas will have much less that agactor. Consequency, take gas were now more more re-tention them the ult which formerly extend. In about, the voids in the crast title will be got vertices degrees of treates, but all, except these near the extentor, at less degrees that the persui extential atmosphere. exceedingly to expert a circulation to be set up in refrequency of the instear; to get to an exalibrium. The fact that nitrogen has normally a specific greatly lower than that of six would naturally facilitate its

esit and presuce circulation It is believed that there is really a cloudstim into and out of a coal pile It he been estimated that aim and one-half loans are regard for an entire change of However, the period must certainly vary with the note of alexentico if we are to regard the formular explanation as exercet. Has the period named util and thereof the When both albe on tell and wide there will result a circulation, and recombination of air.

and extends in the coine. Manuver, after all in said

two or three three per Name thee back on experiment was tried which tends to convert A pile was posvided with a continu bastag one or more doors or flops which

"HE pirace "operations combinion" is a furnity triend of long steading; but the energic person might be perfored for feeling that it represented wordy a convenient ofth is cover the free that can't be explained in any quicky or stear fashine. The feet is, the confidence under binds and will spirit half, the confidence when the control of the property of the confidence of the control of the con

could be opened or shored at will. When the days were core, the traper duty new, when closed, it fell First and seem to facilitate self-fring. There appear Fine one levels in Spellinian estidents. There appear the between contract pricts from earl means an estimative total area of eval expired to the coldining influence of the first color of the coldining influence of the state of the first relevant is shorted by the periodic first section of the first color color regions. Note may finish that the horsense of zero is a small austire. This is a minimize. If the large of color is the color of the c seems to show that there agest have been a circulation when the specime way mannered. We may learn a very test lesses from this experiment; when clerals tion is stated, exidation is brought substantially to In fact, if we can stop ele That the absorption of sound is presented by That the absorption of second is necessariled by enologies of heat may be illustrated by the case of a literate coal short. The interpretation of the literature nemma cont stard. The inspersions of the floresing and engoing air were taked at the start between, and found to be 17 degrees Falarestow meet: Why was the empiric air so peach Wattow? Well, about 8 times as great. Fine real is accordingly to be vi degrees could be accorded for by the level of the betters. This leaves is degrees. A small amount of heat rould be ascribed to the heat thrown off by men

ne desperous cost.
Theorousis vertilation is probably a sufficient remed provided three are no interior points for removed free a fewly notified current. Low piles, narrow at the low, contribity one natures. But when are "low piles, and what is "hormor or the bear"



PRON COCOA AND SUGAR TO BON BONS: CANDY IN THE MAKING

ı .i.

Reasons Why and Ways in Which By S. F. and busy beauty, so sendy approach me do the site, they are more varied in their effects and interests than the been or social waste. Though the Termiton or social wanter

The Wars

salether to the serve-wheel order, terr reserts se habits stuffer to the merginelogically un-Benenestrone unio, it is above the latter group gars a nurlike sales ofly toward tribes of rein

that shown a warlike sales only some of these of visited and equally powerful species.

3. 41 worthy sevents of warlaw them is given a bilary of the curse that have held to it, the norther lattering to the curse that have held to it, the norther lattering to the indicates at on what held to that should contain fasters on the part of the rather perforably de-voted in the arts of power and the patients of pleaty. We want in the sampled to find that these mitting habits have, so is either the wars, caused reveals through the task have, so is either the wars, caused reveals the cause at other and supposedly receive releases have gained. Home of matching have littledly demonstrated this We can hardly expect more altraintly sectionally

Among all the hosts that computer the fourteining warmer arounds. It is the queets that are the plottern: they alone establish new columbs. The wingless worker and, no matter how far they may wanter, always rethen with or without provided to the tellul home-where they are here. It is their inherent duty to make the edgey habitation a livelike piter, there to serve their several querts and princesses, to play name malfito the country provides and to labor continually for the good of the tribe.

Deline the social bees and waspe there are many

opens in the ant next that get along anticulty, but other a time other winged trinceness are been and grow up and some of these ordinally recognize that there is too much divided authority, or size there are not enough one must constant anneaty, or one never are not encourage worker subjects to serve their needs along with the sent. Thus when cross this old unp to get away and start new the princess takes to her wings, followed by a host of the admirers, also winged. But she is without



a recision of worth-while affirments; three are no not water to slid but effect. What they must be done to sivelay diliments, her nor always with good fedgraed.



sherker's pest and be g a Synchrizing blod gapt once her up as the laboral through the lift from game stalk in the trade. No may service and flat is must timifize quit the couldry staffer a vide next to extend for even the impactable shares to enter, a deep creat in a root an obviousle, as and wond-borst proble lavors hereon in a log with his one result could introduce, the dweeted and hardwide-che could be a fine of the country of the country of and ready. But she may corried the filling the prof-ietary of another and solony, and of the countries the filling of another and solony, and of the countries the kind, but of a fredel nero.

The reliest ally in change:

The relaxy also is deleved; the politices of three out for follow who in or manus soften hee, averytice and the ingritisping follow as her estimant; also has those become couns of this being distants, but being without enabled does not dissue her. At more site currentees to chan-hours, expectably that given of it which advanta hear the a numery. Some eggs are held, the city, happing little antique hand and the surface of the three. In hea that two works of early agenter wrether these bald two works of early summer weather these balles grown to side; stored their loss they steat, elliptical, ellissi occords which the cuses or to places affecting the greatest solici had. In an day cach becomes within this sack: a whiteher-orecure that loss makes his the ghost of an ani-other work passes and it extra spec the cursus, and takes on other, everythen the loss and it few her

unning about, sprenged to unning about. In herodity the unio has eryers and marmed. Probably: there men leave of their point through a rearn, of p the very lear of their gaining their complete power of measurest, as soon as they are able to run about a so that, before the s



the company of the state of the

eries of ants. The ploneer p on blindly: he tion is not supposed used we consider that it prevented entirely by send-office powers of an when they corrisols the inversees of an one-we might say that they are nominarly if it is that they do not possess mees, but receive o

Pechaps the plonsors are indiffere of a for, for they can hardly and However, with the growth of the o and a flowy in its next many undersole one and those make one. Canall

f-doors say and so. It released aren't concern als of all the bigstly







The device for natematic adjusting of the front-end drive, which turned out also to rob the regime of much of its witeration

Taking the Period Out of the Automobile Engine

se to attainment when vibration is entirely ellu-Year by year improvements in this direction salest. Year by year high-research in this direction in whose parts we wisers serve until more about the mean way the server of the server of

A rough-east drive, as to fit drive on the automo-easter in community of edjustment to comeate for the narragi or which takes place in joints and bushings to allest chain. The chain is also subject to a

th the back of the chain

clearer picture of what makes an apparabile explorificate than many engineers have ever held before. The figurated is mostly measured on the rece end of the crapheness. It is not hard to picture what happens when the first cylinder—that is, the one at the pear when the first opinion—that is, the new at the funct and of the engine and families away from the firehor—has an explania. The force of the explosion oftens the plants downward line is projective qualant that the property of the explosion of the explosion that the explant of the explosion of the explosion that the explant of the explants, the explosion, down-teds. It receives, the explosion of the mass and the except the explosion of the explosion of the explosion of the except the explosion of the explosion of the explosion of the except the explosion of the explosion of the explosion of the except the explosion of the explosion of the explosion of the except the explosion of the explosion of the explosion of the except that the explosion of the explosion of the explosion of the except that the explosion of the explosion

care of the beary Symbol and the our SHIC Was

case of the lawry flythese and the out level; when forting it the level to the present constants. The level control, there being been the constants from the level control of the level control of the level control and developed and fine level; include alreve, and if it is short and think it leads a tritle and the level of the level control of the level control of the level consistent with the level control opened the level con-position with the level control opened the level con-trol of the level control opened the level con-position with the level control opened the level con-trol of the level control opened to the level con-trol of the level control opened to the level con-trol opened to the level control opened to the level con-trol possibility some that the deliver is control possibility some field the control threathers and possibility some field the con-

on devices have been deviced to break up this

elieution. Then have the foliag that they allow the vibration in expelier whichly is the crushwhaft to be transmitted through the front end drive to the comwhat and processor-bath. The starp jork that the recoil of the crumished imports to anything solidly contracted with 10 to a section came of already on the (Continued on page I44)

Putting the Tire Inside the Wheel

PRESMATIC tires are very fine indeed, reasons a

Provide investor, so long as they conside personality

But when the energieved projectors or him-out occurs the driver who chapters he so experience as to be of high speed at the tax ment stands on souther ritte and himself. More ever, the presenter the entiting so must a surface of contact to the road at a

or regree; so small an erea of ruider and velga gives more et. or amail an area of tuber and volume of air to take up a given shock, that the jer upper necessarily be transmitted to the our threads the sec necessarily be innomined to the ear through the ex-cession resident. So the inventor it question has given us a new design of wheel, with the embler and air triedle, as undestred in our two photocrapts. Deere is the usual hab assembly, and the usual rim, and there is a this size of solid rather to take ears of contaget with the rand, with its investible wear. Between the new abstract in a continuous contraction of the contraction of the con-traction of the contraction of the contraction of the con-tage of the contraction of the contraction of the con-tage of the con-tage of the contraction of the con-tage of the contraction of the con-tage of the contraction of the con-tage of the conwith the runs, with its mempatic west. Detects the test there is the "like," considing of the facility insec-tule, and an outer shor. This shoe is made in two belows longitudinally, fored with notal fanges which led together around the outer and inner circumfer-

Since his safe futrition in take against the air pressure, while it is entirely t from mechanical wear, It

present slow, and part burly it need have herly it need have no treed. The placing of the tube inside the sine is a very simple matter comwrowiling matri tave to getting a chor on a from puncture and blow out lineares that once in THE remain in a long time. Pinally, the invenhome built of the tire t in play at every given measure, so that there is a worth more people and effective absorption of all shocks, even though sold reliber is in contact with the road surface.



implied to an extra-claim analyzable. For the present also but it is in a place tills, it is defined to give below makinging there there when it is couldn't be yigh

SCIENTIFIC ANDREAS

VING come into possession of a cas, the one item of ex-pense attached to its uplant which is resily natived in that of all. By the word all is near inheritant and first. These two po neglects, sell their consequents in tetredeposite rave tests, than at they think in the hither of the saturation. In this story we shall thak of the inheritant sell principally, sell by its weaker sell all the first in the first in the saturation of principally, and by its weaker as effect both on the trivial is not in the emille and the mostly we must accord to old if we want to keep the matter word in high-result. ch is really noticed is that of all, to property labelcones

Place is known as count-case district in one of the What is maked in consequent the connected opera-ment important factors preventing the connected opera-tion of an entropelite order. When we obtained light guestles in the very days, there was no wach thing thought of so disalous of the oil by the first. The first tapertiest resulty, and even if some of it did not do so in the carboneter or in the ramifield, as soon as if ed the het critative and picture, it became was and reached the bet cylinder and plotds, it became gas and actual with the six. These three are past finester be-cause of the grawth of the use of the automobile and the most for fact. The retiner is more put to it to get all the fact possible for automobile took from each burrel of crode sil. Much of this lower-grade furl doss not reporte unless it is made very hot or drawn through the madified at a very great speed. But there are many conditions of working wise the costne is read. as at starting, and when the air and first only agh the munifield, coupling the finel to run drawn into

The body of on all is called its "Thereits really supplies the resistance to flow; we would may that superprise the resolution of the state of th Oil is very different and is most associate to tempera-ture. Another point about oil is that it issue its via-culty very fast when the first lot of gradine salars with it, but further additions do not that it down in the same proportion. It is very difficult to trill by the fiel or appearance of a med oil, her almost here tends It has been contembrated or how much more it would stand before it fails to be not good us a labelcant. Se much depends upon what was the evident state or viscosity of the oil. A very heavy oil will adone its less of body very quickly, while a thinner oil too support to be quite near its original condition, even though it may excell sower fact than the beavier oil.

To to now makely seems to offer a definite suggestion
as to how crack feet can be allowed in oil. It is quite used to find 25 to 35 per cent in the White said 5 to 25 per cent in the White said 5 to 25 per cent in the Statement. It is the writer's opinion that the names of the sill have been cent to with the said the said of the sill have been considered that is prount, or commiss certain initiating properties, will be just on good a bubbleaux own when said when the said said to said the said of the said that is properties as the said that the plant was the said that the said that the plant was the said that the said that

compared on the first content and the same content and promotives furnishing to the the latest content and the same content and the sam the olds from either seeds or note will provenily present chaptering. The effect of this added all will be to make the original oil See more freely, it will make the oil stay on the surfaces of the nortal larger in the frees of

a very thin file.

The cost vericus result of water gail pushing p into the oil is due to the amount of dist which they carry with them. Seem of this is meshed down the walls of the cylinders, and dust and grit from the top of the piscons. In addition the deposit of carbon and dirt which is always on the hadde of the pieces, is invested and drops into the creats case. All this are as a grinting united at your regions will show as read-as 20 per cell of with soil analysis matter in the oil. If the all could be kept closs, that is free from grit, it would not in under condition very much longer than wome fact in tegenal continues very moure singler man at percent. No matters how bright or pule the off in when put little the engine. It seem helds black due to the very small particles of south-a which collect. This very small carbon down but do may have just so holg as it is not gritty. No kind of libro would in an anterestill.

What Happens to the Engine Oil? care in driving particularly

> Spores in the Upper Air
> Di the use of the simplese the coalests of
> phere at high attitudes can be studied,
> weightings have been useds by the office
> investigations of the United States Day railtone in conservation with various reading the agoves of plant discover, splanne with agove trape it was pos-incrines of spores at serious silitation conditions were than made in Texas, N-ing, and Minnestis. The spore trape the countryl consisted of silden trasted. ned in comments one is a two

placed in compentations in a nec-attacked to simplane, so that each is express and closed at will. Discussing the results Elvin C. Journal of Agricultural Resourch Squeen and politic graits were reli-nitiesless up to 11,000 feet. They we "The abplace is a great aid in studying the distribu-tion of spaces of perbancic fungs. It is likely to be very useful in epidemiology studies."

New Uses for Rubber Milk

THE WATER OF THE PARTY IN which is the more contact term, in the later of the miles from which crude raider is made by congulation with the aid of aride or steaks from learning rubber tree ingree. is substance in new a receive connectity on the market and is used by rabber makers for various parpower, such as the disping of fabrics in the manufac-ture of rather tires, imprognating textile malerials for many men, etc. But the rest interest of rubber later hysics, who is not converted with rubber goods manufacture, is in the multy applications to which this strates, excite substance can be put in fields that are not connected in any was with the rebber industry For example, the glower and painter know we drawbacks that are provided by redirect patts. le a nixture of whiling calcium corbande Station condition, and convent Travel oil. It is applithy used for beiding gless windows in their frames manny owe or restrict glass supplies in more remains. But after the putty is day, it falls out very easily. It seems to possess to adhering power to the wood or the glass in the day credible. The result is that the page of glass is say to full out and break. But when public a is used in the clase of linered oil in making posty, a overaget in electrical solven will attick both tam and frame indefensely and moreover provide an single waterproof joint in the window, anaconery wave-poor justs in the undersor.

Highly substitutes not rowd in pucking mathresses and
in the upholatering of furniture, dispuses of all north,
feetbest, straw, hay, wend until, samplest, output, work,
hard of vertices origin are notes of the materials med

for this purpose. Seem over of artical origin and hater will be extent by much have. Practically all of these substances less that the closely after comparatively about magn. Purthermore, certain of these filling ma-sters are the comparatively after comparatively. short large. Parthernous, certain of these dillar metals are manufair, especials when they are packed frightly and do not allow the five possess of these dissolutions are determined to the other handless of the dispositional with reliber lates. This arrays make many lettered in this neature and other in-prognation the rubber may be relevabled and a perfectly stated entities of the disposition of the rubber of the rubber

Fundamental is non-stuffed with this numerial will retain its shape indefinitely, as the replectorated scating will keep its electricy for a long time. Weaker steffer and other similar salmal reletance tree staffing and other similar animal releasance treated with roller lates quarte le decoupt by good lates. Purchasoner, it is not recovary to use on much officia-satisfing, for the desiritity is condensate and Since-taging, for the desiritity is condensate and Since-taging lates and the size of the condensate of the upobasients; saidle enhances the containing of all through it and presents the naturary properties of the same, Plantily four surface containing may be sourced and changed by weaking with that or end water and their part of this roll enables, our, again in June and their parts of this roll enables, not, again in June where the control is a second of the control is

selety the map hastif, in the man

manufacture of visites, Acco Radolph Ditmar, who has deter work slong these lines, when vimade from wood, which has been improg-rather later, instruments are obtained with in quality of time with the old limits re-effect structured by the rather later, seems to

the violis strings.

There are notify other uses suggested for relater which extent be gone into it say detail Arrong these may be mentioned its use as a countries of the project of circle, composition factoring.

A Large Es

Inventions New and Interesting

A Department Devoted to Pioneer Work in the Various Arts and to Patent News



d metal constru possible vecuum be ger Vacuum Bottles

Bigger Vacuum Bottles

I IGE vectum is the best insulation.

Ensow to avience against less or cold and over above bowar invoted the first vacuum bottles for the soungs of liquid air other invosince have ireful to construct glass buttles and notal bettles of large size but without second. The two-part size is still the largest place vacuum both manufactured, be-cause the thin glass construction no recame the thin plans construction measury for the heat expension and entraction has made forms also be first for formstrong and the beauty of the heat have also been impossible because office they were executed in way first their large energy plans. gives off from the narran-well surfaces to fill partially the various space, which to fill partially the vaction save, which, predeced a live weating and resulting power treatation against Joint or cold only glatimum and one or two other of the very year and expensive metals have been from whitten overladed games on their surfaces, and their great our pre-lated their commercial use; but glace has been found to have almost no sur-

VE a new invention combines the Now a new invention combines the ode surface and the metal walls, unde-g peatile large sized vaccion bothle-id with specific containers as shown the Unstructure. This speciments need stard is made into the desired ages, there being the valle to work eration, the limite just a little smaller encourse, the music year is not similar as the extender them parts are then paratify cleaned (pickled), control the light glow, and balod at a very glo temperature again to glow is reciply framed to the circular strates. When the flat space between two flatis of the construction is economical it singular personal it is place striken gives off the said the nettal fundation, provides a selection of the selection of th



Nigation various containers can be made to deliver les cream by experts or investrates to thomat places without les and at a very great saving, as the ship-ping weight is less than half the level method. Opviors, milts and cream can also be delivered to distant places in the NAT. and measures after men found for the big variant bett

A Better Tool for the Hodge Barber O^{NE} pervis cal control the session (40 lock) size of the new height trissuer illustrated: while for larger mark a 40-lock size concer that is intotaled as a two-sout job. It is guaran-teed as tries from 300 to 500 feet of letter un been, triuscing top und beth sides. It is driven by a pre-treath home power electric native, operating on either

power electife motion, operating oft either direction on interesting current. As near translet sellert, right moder the operator's fager, makes control simply and instan-tances. For current simply, a special in 100-foot lengths, to corb to any con-section of the current sellert in the next sellert in the current sellert in a resity anisotness one, regarding several busined both from the measure business. issest wirthy in recommended, with effets every basicred fact or so; and may be engowied within the being



track for seatherin and assertion of

Minutel?"
This perty inchained scretary who have summer the sant the sent the sent of what was the sant the sent of the sent center of the toky meether in a but, And her the sent of the toky meether in a but, And her the sent of the s ing a typewiter in a box being a sect of a being. The writer, who certainly is not interested in the sale of this or any ther hyperrise stiarboast, thraght a Part after a trial test of the bac be filled it. It seemed salie practical and exer-

thy makin.

The box has a binged top, but it is not necessary to life this top. A slight pres-sery of the left thront on a bottom recover If to rise—out to pop up like a Zark-in-the-bes, but maker cately, for it is con-troffed by a small alr-plotus, all the-work of sparting, etc., in data without calling the cores, however. Appropriate better exhibit through a long, farmer has the child through a long, farmer has, this shirt being limit top and bester with next deep felt having "whitem." There til is account the levers, heeping the synth in, but my preventing metion the synth in, but my preventing metion of the levers.

Not only down the box beap moles to, but it beaps down out, a decided point in its figure. Of ourse, use the least the

day, housest, unio "all the different in the world" with the prompts of racket that gets loose to peeter people who like to be able to bear themselves think. The derive suight even keep the books respec-sewers, while if they is the larger it certainty week's analyst the halo

A Jammed Key ONE of the element methods for re-needing a Jesseed ker, leading stat. etc. which we have over seen is contrib-uted by a punior of the Proclem Phys-ner. The productional stud was delied legiteditalic with a leve of constrict size: etd (bis lede was tapped with a left-located top. On reaching the Notice of the boile, the tap of evarier to (exceed) and returnity, so it was comed

further, the stud was passed slowly free its week New Launching Device Tha Halves the Power Needed for Airplanes

A HITLANDS must have being en-digine to be able to per off the ground, or to "take off" as the sero regions calls it. Once sixt, the metitle on keep on firing with little cater out keep on fights with little for taking off. foll regimes at the present than, and this

Mitgo, as well as a great deal of faci ie ise telp. Genuit etickeen have levada out a new drike. Which humoton the teaching into the six by a powerful hydrostic pietog , the meter fixted to the altriony to

lot, the motor fitted in the alligate is quite energy energy for maintaining the marker in flight but too week to it? the nucleic light the air. With this draw, the regishibly of neservial airpleas is award, as tir state modific because more lighter and greater personage of the lift can be willised for insurances and stools. Wire earling the landing cheeks and sleet of the sindate on whiteness has the body, said the mediate is placed on a curriage which rute on a shorther trust. The holosofte piscon forces the mericar along the track with great speed, and when arrived at its end, the The recent gliding experiments corried out in Europe showed risurty that by for the greatest ettergy was required for starting a glider, and that, once in the starting a gibbre, said like, other in the sir, a glider can be love, al-ft, with 42 willing street agreem of exercis. The new starting device, which will men to put in operation in General for the nurbines serving the central Europe These, will allow the constructors to carry greater loads and more possessore with smaller engines and less test by applying

meen made with glidere to



A better handle for the sh Old Ideas Made New TWO facts suight and used yours ago and the principal features in a new chase tundle new bring placed on the market. One of these ideas is that a stick of word is much atreager when a

strain is placed against the grain than when applied with it. As a log we were when appears with it. As I may we were
reld to bell against the grain
of the bull-out with it. If we didn't-The secuted ideas control from the hat-heard of a wagest wheel. To produce the strongest grip for a lend-the blacks weith stowers the less or steel boost on te lish. It mover gare way.

With this new should handle, the g is perpendicular to the blade or grip and the strain is squited the grain. The result is a shear matery three strong in fact, almost transcription.

Note in the Distriction of the m handle. tie steel hand courses handle, the steet table compresses around the ends of the proops and in the greate of the grip. The proops are relo-fered by the overageted steel cap. They

are curried to to the still size, or practically one-half size of the sten. There are no nivete to senten either the produce or the grip. The comprehend anpriviles of our gray. He recommon as-mouled store hand grays fighter and tighter, shatler to being heated and shrunk on. It simply will not let go, There is practically as model around the grip to come in contact with the hand, thereby avoiding freezing and clitcing to the hond in cold washes, Three is also no checking or splitt the grip, we that the hands are present free pinelitis, and the grip is wide that standard building, allowing year

A Mechanical Knife-Sharpe The a slow office, indeed, that he not now supplied with one or more of those very leady poted sharpeners of the coffee-grinder patient. The idea is no



es as we share



may be got out without d the se

good, in fact, that wase elever person has appropriated in for expension to the field of knife siney-ning, as the unresed photograph indicates. For the salled print ers of the petril sharpware are saled-tated mitiature principalities, set so that a knife may be held between them in a Brile red, and operated more on help fore stratturered; by both wheels. A few tarte of the wheel, with a hothrises back-and-forth assumption of the limite, and the trick is done. Perhaps the same teur grinder, with his manalete talate as to how less to bring the buildestact with the starpener, will be the greatest invacinistry of a sources that to to the detail for him, by mean of the pregramped writing of rest and Ntode; her own the professional will dealties find that the markets works

fer and better than his hands Pretty Figures by Machine

DERNINGSCOPE is the passe of the of the pup, and the tarse is descriptive The instrument is a modification of the taleboscope ides, with the difference that if does not contain its own him of reliced glass, etc. the western fewer leaves, prink, etc., in its field, and on looking through the take one facts that the several narrors have done for these what the knield-scripe down for its glass exte-reflected them in several didensitized device of these. The doecope, however, is not a toy; It lie offered seriously to the designing profesactivative designs may be realised set of hits of string, rays, firests, legues, tip-



A Place for the Curi Do the durants on your our new one open betteen and spill their one tern type section and spirit time day, tern spirit year passengers? (In do they your liber the car wat, where then are get at only by disturbing the pas-seagers, and where in the largests the weaper, and wave in the historial the Jack is filedy to punch a hale through there when you life a bump? Procedure for storing them, brocketer, has been pretly length; estimate to a chains be-tween those alternatives, pointer of which is whelly sathefurtary. But now a tried section is provided, in the so-ralled "retriate carbe." Place their ster-op-point at the rear of the car the cartules can be get without disturbing any lady count the secure who gets them and they need not whose the excepti-over with anything heavy enough to do They say, however, very recommently share II, when the top to



up, with the log in which ties is given

oten drant, as well so with other light articles, to the corner's pleasure. The

fex to the owner's pleasure.

og all the took of the ab

The Universal Grinder SOMETHING decidely elever is the News of an all-propose outsi for the ind-count is obsern in the adjusting fi-insteadies. On the one should are accorded a course and a fine classics wheel, a minding cone, is beather intro-ying wheel and an energy wheel. Back of SETHING decidedly elever in the ying when not all envey when, there is accreaine from the adjacent vides, detailing the memory of walking all around the marchine to not at the rurious whenia. Arous the front of the off wheels extends an adjustable alide table, which may be tilted to may single desired, and which carries a shifter fortiholder for helding chinele, plane bits nationly kept saturated, the oil belo matically kept autometed, the oil below driven out through the pures in the wheels by controllagal there. Roundal de-tices present an over-accumulation of ell on the wheel face, and keep the oil frost figling off. The mantale in beli-beralize throughbant. A before manne of meeting the pitching and busing register-ments of the controllagal and busing register-ments of the controllagal and busing register-

Using the Stethoscope Idea for Locating Machinery Troubles N Exchang a Sear Brief desire called "Normant" has been placed on the merket by a everputy in Newcontinuemeried by a company in Newcontinear-tron, merially designed for materials content. As its name suggests the par-pose is the detecting said levalings of solous in markings, but in usuay mag-netic works it will also be found use ful. Practical engineers have been in the helds of making our a send, or the bates of making me of a strip of the word or a start rule, one rul of wrong is placed between the tooks and the other real in applied to the machine sta tied the source of soles and with your machine classes this

meats of the shap weakl be be

earlied in different of any business The Sychologic in a stellow-spic defice which exceptes a very study gave me on he applied to parts returning hore readile. It comprises a hollow matriffle from about the discreter of a half-fellow

tresents say would to the di with which it makes comput. opposite wall of the Gress are after and about three fest long. After pittle latter in the earn the near ag the receive to the scape merbby

A London engineering paper in We have treded the applicance in more ease: (in a four-quitoder patrol stag which has been in the for several years: on the powerf benchtick of a latie and on on air compressor cylinder, and is each case votre able to detect pales which were quite installab to the un-sended our. We found for instance, in and ded out. We troud, for lamaners, or the case of the autometr angles, which cylinder was the meet body in speculies, though we could not say exactly what the toder was due to. In the case of the tode was due to. In the case of the gented bendatork, we were able to desert a point from the gente which sup-ground exempting in our of the wheels, and in the tilted case we were able to hour cults thenty the setting of the air spires, which was understable other-



A Colispeible Stove of the unremobile empter to lead down his marbler with all the family Large and Promise, including even the Mirber stree. Mr. Nelson E. Smith, of Spring Valley, Ill., takes some of the sting out of this partirator just by providing story which could be taken above at



of the extense. The size which he of-fers to 28 Inches long, 72 high and 71 wide; and it collapses to a height of 11g lordes, its other two dimensions, of by the property of the state of the pipe being ported incide the best suesther set that it is included in the statement of bands-one discussions. The pictures welly tell the state, and beare little for welly sell the story, and leave little for an any other than that, when the thing is may other than that, when the thing is susceptible, it is easy smooth by belief a very effection such. It is desidedly rechesting to chroatele a super-invention that alone at excepting other invention that alone at excepting other. than everyone of finel, 2

FUNDAMENTAL among the require actifics in a survivality sciences. and thereupon have along sold the a figure that rashes their parchase a part.



civiling objective, at a cost the the tendedian mark. According majoric structures, this is made, by the development of a saw it for shaping glass lotters, which the summiffective of a shaple less federally grant curvature to give endow of from 125 to 255 di-This is broke out by editorial ex-tion of the apparatus, to the exte it looks like the accompanying graph and works in claimed; the objective gives higher magnit low-power overgotted sucree

los-power occapital microscopes of fi-millier types.

It will be observed that while all the execution parts of the references are present, the table is missay—the sale water of evolption leases it is not needed. The nature, the stand and the eligibility are quite capatite of the work organists are quite capacits of the work of a micro-scope, just as they appear. The adjusting arrest gives accurate actings to thousandthe of an inch, and is every respect the instrument apper to be a real seed and not at all a ter-

For Dirigible Furniture

M. Offer of the have het experience with
M. enteres that will rull out to the
direction in which they happen to be
pairsed, and which started into entere
traction only with different. A belllacetta couter as a satisfact of this probme no set exactly now, but the configuwhich we literately now, but its claimed
to be quite notice in having the beautiful
hearing in the losse. It is this bearing
hearing in Can losse. For Dirigible Furniture which receives the laboral ties metal to rob an causes metal to rub against a it is this which makes for sic lay or note at all. In each car new model there are no less halls. These are all bardens labed, while the jokes and w





Killing the "How?"

DOWLE and superils on the radio will become denotes it is claimed, with not beginn denotes it is claimed, with not beginn denotes in the treadvanting industry, if a new invention of C. C. Lauvitum of B. F. McCannes is generally adopted, to world breat and strengular that et the radio far's our are also et in

The work work and atmosphile that worked has been suitable, usually discussed the suitable and the work of the suitable and t layer to do its to find the neighbor who is requestable for pour treebler, and per-sands that is limited the device. He will find that he will not only be design on a favor, set will increase the miscensis of the contract of the contract of the training. Number one invertible to con-tented to the serial, No. 2 to the ground No. 3 to the serial bridge past on the set, and No. 4 to the ground this diagnost of the serial will be to the pound this part of the set.

IRT time ago we Hipstrated a couraged from a metal of chance and gas, and we now or type still using the liquid container being a stoot cap

with steel wire so that if is abunitely with if the directions are pallowed; and if they are not, there can be no accident. This is a very velocitic decrease and re-This is a very rejective mercer are more it entirely from the class of the ordinary siplore which has been response. The cold water is introduced late the slabet until it is filled up to the red line. gless tube is then inserted and the head is accreted on utter which one of the Is scoreed on other which one of the send couples or bulbs is placed in the holder which is then averaged has the highen head shortly so that when the fined pits in the heat penterness the suf-end of the couples or bulb the gas will have gradially and passing through the place tole charge the value. While this glass tobe charge the water. While this operation is gridge on the sighten is when the shaden follows as to assist in the proper charging of the water. The expend and its adulter receival to place upon the sighten in energy. The pressure in the expends in the space in 1000 persons to the space like they are based to 2000 persons.

A Useful Indoor Tree VARIOUS are the mispelite racks offered the branchite, for benditor towers and other impediments—se li-instrated one, the other month, with a instruction one, the other month, with a functions remark about its resemblinger to a synthetic Christman tree. Here is another one, differentiated from most of its kind by the addition of books on the state of the arms, and by the possibility of hanging it in either of two quite dis-tinct positions, to fill either of two

In this outsity have convenience outless in the kitchen. The beautiful mess the audiet of her kitchen light as a correct outlet and abe is not willing to be de-prived of it, even for the sales of a better flatt, but alse mould be very happy to how both. This is what a Oldergo eraton given her in the conditation little fauled. The light is assumed close to the criting and enclosed in diffusing

New of the Hight solliks wind bo

glamuse, as recommended by lighting experts, but hanging within over reach is the absence switch to which who can attack the cost of her electric has, topolog, or whatever electric applicable she wishes to use. A bottom perjecting nor events to use. A notice property from the same play enables her to action the light on and off without interrupting the first of current to her electric iron er other spellenen.

Electrifying Dust Poison to In-crease Its Efficiency Willie espectavening with airwords, the continued experts to extreval-

due a need better jub of polarity route to drew with an airplane than with during merbines corruped on the Senting for the reason back of this it was discrepted that less dust exalf he named because the agriculture of the air by the altriane propeller broke up the cal-cium pretable late fore particles that



III seesatata toereat sapplying pe The the consisting hydrodectric sta-tion of Montacles, Mexico, is benefit improgramed with solfuric acid. Inde-It would be hardly an exaggreeion to ear that the plant ruce on dilute subfurit and Naturally to ordinary wheel took survive; but a Pelico wheel has sector survive; may a percent whose pas-leven de-lighted that permits the use of locates, brance or maked metals at every point exposed to the water. This far-letter is now being mutuals turned in Phil-liter is now being mutuals turned in Philedriphic and will unspectionally give

ratemely adverse outsititute Doing Away with the Radio "A" Battery

HERE has recently appeared on the THERE has recently appeared on our application of absenuating correct to hear the filenests of radio-frequency and endis-frequency amplifying tubes, with-on the supposed and expected ham and distortion. This desire does away with the use of the usual storage battery, the use of the usual storage battery of the battery, and therefore reduces the operating costs of the usual radio re-

The present device is not intended for the connection of the usual detector rule. but in Bushed to the amplifier tubes. This is largely due to the critical char ristles of the average detector tabe. However, this firetire will operate the limit detector of a super-honorogime re-netwer or the detector tube of a super-representive receiver. This is because





ctact offices. The vertical position reionlarly gives it aspects of utility in world corners which are not to be

Light and Power for the Eitchen M 087 hitchess are lighted with a low-these, have lamp suspended from the center of the office, and (owing to the greater intensity of the tangent the greater transvey or the transpore harp as compared with the sid exchas-figurent lung; this produces a combine-tion of giare and given—giare directly under the lung and given—on the wells; for the housewith's singless in always or

her work which is done could near a well, at shows, sink or kitches cubine, with the light behind her. To correct this faulty Humbatian the correct this thinly implement lighting expects recommend that the light be mounted close to the colling and hat the lamp be lackaged in a globe of rest glass which serves to 45 the light raps, produc

Both amountum bitche-lighting en-polges have shown that the American bousevide has some likes of the regarding the picking of her bitches light, as adults that the existing high, as and often to the offling in a range improvement, as ther as Simulation is consensed, with the said John to get extends the ray describe that, are busher (the supply, if I could make it.)

which the dust particles were buried through the air resulted in giving them a monitor charge of electricity. The cotten plants are negatively charged. Hency an attraction was set up between dost and cotton that care a theretag polesting of the worstl's fixed. Exercisents are new upder way to accomplish the same thing with a groups energied reaching that the airelance does to calcius, premate. Initial tests ind cate that it requires more than the agielectrity the dust particles. Ground re-tact interfered with the electritying processes. The atmosphere apparently creates an installation that helps to per-tions the positive charge of electricity. The problem at this time involves the descript of artificial insulative for a graph machine. R. E. Oosl, who is in

a ground operated machine could break it, thus working it possible to apreed a gloom assected of polests over a greater area; but more important than fife, it

ground metallise. R. E. Coud, who is in change of the Georempert Laboratory at Taltipla, Liu. reports sureline prospects transed coveranting this chainly. For solution in practical use in recently in-results his practical use in recently designed madditus, also to contrast the precalcular junctification of the possibili-ties of using the slepton for regional grouping. Mr. Ones recently shard Con-gress for a Special appropriation.



the detector in the reper-bottomipter of sage-registration at it in an oscilla-ing condition and has been relical timconsistent old fact over critical fla-tered frequenture characteristics. It has been found that on a stope take super-proposessive wit his the attackers, good results can be obtained with this form of figures, current sup-In the case of the negal ran of cirruits which employ a pre-ow-that he detake, the present drafter may be used for the smallfer takes while the dejector in

presented by a battery-operated tube r by a crystal deterior The new draine is not intended for the plate electric of the until simplifier false, "15" leatners being retained for this purpose. It is under in several sizes for exerciting any number of tubes. The he operating any named of tures. The current to direct current, but on the contrary, alternating current, stepped down to the proper solution, is applied

Saving Safety-Razor Blades SAYETY-RAZOR twees are of two ability to use the blode u few itness and throw it save without bettering for ther with it, is a delight seed ther with it, is a delight about, and these whose composited scale are offended by this waste of the little metal swhere. For the latter serves there is any offered from Germany a little of ster which creation the user to sharper his old blades for further use gally as emercially as he will ever get them sharpened by saying good means to a professional. The blade is set in the are letwern the two pickers, and then ing, first on the one chain and they on The result is an accurate plading such as an apaster our



F the smaller elses of unthruckle cust, such as rice and burier, are to be stillard a fraced draft to prevenery, for

prillard a money craft to network, we the wish between the grains of such count and one too small to admit the 160 chief feet of air memority pengerly to home a single pound of real type of further nade by a Philadelphia. Fig. metafacturer makes are of these small state of facility below the state. less expending than the sizes commanly used in heating) in a colour manner. The ashipit is sealed up and air is force. into it he mount of an electric mone. This air is faced up though the grate though ruped come and north



tting the felly-bag of the history

dies. The air satiets are placed at each angles that the air block from day two adjusted diets will men at a political light of the political state of the prairies and the two lactors above the grain level. This is well below the contex of any partial five bed und the result is an even dis-influsion of air, with no found speck. All and is removed in the form of clinion. the high heat produced by the perfe of the air into the fire led fortage ash directly over the disc and then over the whole bed of the fee, and fermion practically all the carbon from the coal The grate, cooled by its circulating water. keeps this clinker soft and spet redite to the manufacturer pever "freecos" to the grain and in really broken with a wine har and prisoner

with special tools through the fire-Combination Gasoline Gage and Lock

WX have here a condituation gapt W lock and warning signal. When the handle is turned to the "sa" goodies gaseline force into the gape and through to the carlesteire. By turning the handle to the lock position and turning the key to the lock position and turning the key the goodine dow to the audiqueter is stopped. If the one is remainly and steps became of a lack of gooding the basis is instead to the reserve position and one gallen of growtine is will left in the tests for use. In this meaner the device arts as a variety signal that the gree lite supply needs repletishing...
The glass tableg is of exceptionally strong enterpretion but if it about he wrong construction but if it about he lookes the handle is turned to the re-serve position as that he pussible from through the gasp. The page can be really seen at all times as it is adjust against the partition expending the positive time from the front of the

A Baby Car on a Walking Stic This observation shows what to claimed to be the world's southern which can be alterted to say sick. The lower and at the

TO FEEL PROPERTY OF A SECURITY OF THE PARTY atick is fixed to the axis of the co array is time to the state of the contrago, while the invite of the tristapping channel is cleanuped to the shaft of the shife. A construction contrar west supports the child, a fishing factors in also provided: on that even a very young child can be nated along in perfect safety. The wheels are robber then, and eliminar-thesis are robber then, and eliminar-chesis are robber then, and eliminar-chesis are robber then, and eliminarwhere are maker three, and estimates these man of the man where man of the continuous can be detected in a few events and finder by this a new small company. The man of the continuous can be a continuous can be a constant company. Only the last three first three can be a constant on the continuous continuous can be a constant on the continuous continuous can be constant on the continuous can produce the wealthing of the help can be considered and the continuous continuous can be considered as the continuous can be continuous can

A Stand for the Drip-Bag JELLY and per-cheese, with perhaps were other tilings, are made by the imprestive with the sid of a delected o which the printure is placed and our of which the falce is permitted to drip. Dead klicken procedure, in our was family and we present in years, is to hang the bug on the fancet, with a per under it if the drip in the relushed part of the conception and with the empty with under it if the drip is to be thouse usury and the dreps seved. This is arither the past entwelled, the post poetry, or the past effective pasts of parety, or the iniet effective means of delay the trick; as in analyt demon-strated by the jellydag stand which we illustrate. The atomit fields up into a company approaching sero when not in the, and all other a convenient reasons for being certain that the pan is properly under the dripping bug.



nagnetic prementially at low magnetic ing forces. It is far the entiget of all known entails to be magnetized or all magnetized. When properly heal-treated too lattial permentially is more than 80 class that of soft less. The particular against med.

The particular application which makes
this also so valuable is its use its making subcauring cables. It has recently
here discovered that if this older, in the from of very thin above se ettips, is made a part of the outer covering et such cubies, it will be possible to persist meteogree to be ton pitted at a meny rimes these new strain

A Better Feed-Bag EVERTIONY who has ever watched by a free strength or yet in which adding the side haddened free holy a rate law made emercion observation of the fact that this device is about as indicated the control of the fact that this device is about as indicated and the strength of the side of the fact part of the fact part of first see position of our one tree that the part is first see position of our one tree part of the fact part of first see position of our one tree part of the fact part of the first see position of our one tree part of the fact part of the first see position of our one tree part of the fact part of the first see position of our one of the first seek of th NUMBER OF Who has ever we wards for humans devices applicable to the cure of shimals, and one of their the euro of shirants, and one of their price witness is a new-bag that avaide all these furifier displantages. The salami down't get anothered in his bag; and the outs feed ofers a little at a time from the side pockets into the central compartment, so that a reasonable level is multitabled under his down.





COMPARED with the I of the radio of today, the old o for the transmission of speed conference and crade. But there has been discovered a simple method by which "new wind," so the speak has been becomed on this of but should indispensable meens of other but about indispensible me aumicetim, enabling it to co effectually with the wireless. Not as long upo a new alkey was di-courted which had certain thistage that zeric properties, but its special connetic properties, but its apecial com-tendral replication was not at deem up-person. A mixture of about 20 per emi-nical and 20 per cent inps, it is a sif-ficial alloy to units, requiring special temperatures and apocial-felerate re-bases. After it is recessability made, it



mer. 1404



Quick-and-Easy Tire Changing

Quick-and-Easy Tire Changing THE concrete phenographs show the I node of operation with a new region of quirk-clustee rise for the accomobile. It will be seen that this rise resuprises two solid ring sections pendied with intermenting hap. The two sections are interiocised by ments of there are mon-rised to the contraction of the contraction. server keps late one solid, integral rim which is claimed to have positivally the full strength of the solid one-pleas rice. With title rise the process of the chang-ing is completely reversed. Instead of counting the slow on the rise, the rise is mounted on the sine. Jiscoping the shoe over the flunge of the rim by strong-one methods is no image necesstrangers metada is an image pres-sery, for the two ring sections literally full apart, off the shoe, the instant the new keys are research It operation, one ring section is laid

ze operative, one ring section is laid down; the size is award in place on this and the day adjusted, then the other ring section is dropped into place and the acree keys inserted. Demonstray is equally easy by reversal of this proeduce; and a complete the change can be made to two minutes, it is claimed. be table to two nations, is a construction that is severally

Testing the Underpinning of the

AN instrument for testing sells on which reads are to be halfe has been devised by the Person of Public Reads of the United States Department of Agri-It renaints of a metal disk resting on the soil and supporting a resting on the soil and supporting a cytisher into which shot can be poured. The apparatur is hald in position wer-tually by seems of a triped, at the top-of which in nounted a small dist that tolds to one-theoremith of an inch low far the drisk strike that the soil as shot is pursed into the cylinder. By munner of the instrument it is possible to get



SCIENTIFIC AMERICAN

tion as to how the sell will act wet weather. The kind of soil beneath a road sur-Are the a great deal to do with how it will stand up under modern traffic and this is booked upon as an important consideration in determining the kind of red to be built. Two sections of the med to be built etter number and subjected to the same traffic but on different types of set. One ection part last well while the other levies up it a master that call ing power of the will betruth the read

Converting the Truck to a Trackinger

HERE are disease of those when a dirighte sinds. Tracks, equ ing a right three buring wild tion, per study in the rand quite easily and after they per burnly very house werther there sad In securitions an expenditor july. Supp.



track that changes into a cr

we know you could charge your heavy editions track the a test-type tractor in 15 minutes and change it book again in 15 more-world you not feel more worse! When you are a life, with tired track reling along a screet or a pared country highway there is no suggestion that it is about the exciset kind of a vehicle under the sun to mire up in a mofficie. As a metter of fact. worse than that—drivers of self-direct tracks will refuse to other on ground that is even wettich, for the small dista-eter wheels are in datase of descrine We Hightenie on this page a ne to pri whole, no to speak. At the start let us my this is not securit for regular read respite, but for creasing regular med results, but for creeking local paretre of selt getze, politics out of fichs, gaved jobs and for general "terrigation" around facus in west weather. At the extreme left, out of the weather. At the extreme sett, out of the picture, is curried a need, on which the truck track in large when not in nee, recked up. The truck in lengt in meaning in a nevel manner. An interpredict lifler accorded adjustably at a creaturer and remains equits: the fire holds the track idler out in such a position that the track is always tout, thus giving it

he greatest sured over the gre Practical Use for Paints Which Change Color at Different Temperatures

N certain manufacturing and either I rectain where exceeded bes use le smidel attenuts are being trade in take obstitute of the fact that certain special public solutions are known to clumps their color when in the greeto change their roles when in the gen-cies of small increases in trapparture. Armon these entopolities in the dis-licities of the control of the con-lection of the control of the con-degrees. Centered, returns black at it degrees. Centered, returns black at all older of never y and store, The deaths solder of never y and store, which presents a light prior other becomes a light prior other becomes company and red in their facilities at all of the company and red in their facilities at all of the Configuede, returning to the p

a wise when our

The first of these mixtures is made by properting two separate solutions of expert suffice and patenties indide in water. The second solution is again to the first, and agitated until the pre-ipi nevery McDiride within feelin infide in presignated, then marked and dated. Finally, it is naised with a weather of gaze Abulte and on played or peter Experiments seem to show that up to

tener its infattice of the two separate indian is preferable to the above electful proposition. Mixing to done in an ball sail with the conclusers in the following properties. But Point—norrary lottle 100 parts, report lottle 40 per is, silver fodide 400 to 540 parts Helium Progres

reports stick of britise that would stierwise be weeted. At Lakebure, X J., a like-present, bre-traperature as parater has been seriested for this nor pose. In its Cryogosic Lateratory the Barcon of Minos, cooperating with the War Poperstann, has med noticeded ration to the bade for a slaudy method that is said to slick striking result The inquire helium is prosed through the pervious the cueben validity the s markett property of advoting all of the 15 or 20 per cent of oldragen and organs that materializate the got. The

se reclases to see free the al surfer to 100 per eval partly scall the materials public is reached for the out-The Perpetual-Motion Mercury Switch TALK about tirries: The drap of mercacy in the little glass tobe of the movery switch, which is used to fact on and off the lights in the new est Electric street truffic stgrate,



terrorie from end to end of the take ones a second, which counts \$1,200,000 (from being a year of overlapper operation In drive us. If courts a distator of the a through utirs, alth

The rate is radical for a little rivel pter through prery which ten is of and sufficie the tribs once a work The syntary radios down to one real The mercury restors show to one cold-makes a contact wider finder the light on for a would, then havies back and repeats the operated at the other lifter the mercury loss from placed in the tale, the pir is enhanced and placed with hydrogen, make processperson with appropria, which provide any possible formation of metery vapor by the sports. There are no rectal con-OR OF PERSON barring defects to the plant the take in practically energeting, while notice of the kind used have been run contincouly without a breakdown for two and a half pears. This name, by the way,



The chemical bag that delivers bea on addition of cold water

Heat from a Cold-Water Bag THESE teacements of cold water shown here, will rear with chartistle contained in the bag and give 24 boots' reasonal heat. The electricals are con-tained in congressed form in the inner refil element, each refil to capable of powersing a lundred board heat. Should the heat only be needed for a short period, then the heating element

ind ovel off.
The dimensions of the outer over gre ten by eight larber; the complete high weight about a north and a half. No only on a led source, but she as a great confect to travelers in real weather, this novel invention about weather, this horse president about prove invaluable. Trests conducted at a leading Landon leading contract the claims name for this new heater, and in Committee a large teacher of their

adversal as part of the standard explorate). The Granulated Pipe Joint

PLANGED pipe joints sometimes leak Some people who have but stretcourse reperience with them would say, per-lups in some measure industry, that some or later they always leak. The centest that is used with them refuses to stay put. If the pixt is set up tight, that very art tends to squares the censent out; or in eller words, a high preserve out or in eller words, a high preserve opened he put on it without squeezing the crossed out. For a Philabural materbevegte out we tripe name which it he stated our he benius tion after the without has at its waminted It is packagerized with husdreds of description early of which to rical. These little holes are



Reclaiming Checked Railroad Ties A PEW years ago conseins were so hexpender that little pales was 2.1 Drayestor that little patter was taken to save them. Wast-fulness man in the air. Tuday, this cost dellars where they now most fitness. Mr. Andrew (Alasca, experimendant of the thosepresents and thelesting riset of the citers Pacific Rallway, at Resisted and, has derived a very effective Minn, has devised a very success method of saving ties which have split ducing seasoning. Checked time of this work for means of not are pinched at the ends by means of a lever and rhaits, both of which, together the brawny motive power clearly shown to our litteredists. While the opening is reduced to a crearle, two or three "K-levile" usy driven into the opi grain of the word, helding the split state

earther for the life of the tis.

ne' are upde of street love forced

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As the typist cans the code message off on her machine; the other one tape off the decided manifest

the sudience, the earther help of anywhere from 25 to over 100 thentical functional cornect refle elements which are rolled from a his reliabled usual wheel. The time mests or reflectors are of precise in resitut cervatare and equally helized to the greens surface and small energy to present a conditionly of view, the effect of the whole being analogous to that of a secretificate, which gives a directional beam of predeternipable Gresponse and larenelts. On the latsurface the electrate are ellipsoidal as log resetts at a distance of ten f

Sounding by Acoustical Meti D. HARVEY C. HAYES, use of the Democra physicists of the E. S. ary, glove on accept to the Journal of the Franklin Institute for March, of the methods nitrh have been developed recently for somfling the harbors and divers of the United States by means of the ortho from the bottom. The first method determines the delay of serious at a point between the new and atten-at a point between the new and stern, of the would of the propolity reducted from the bettern. The second de



The caster that adjusts itself every condition of service

the bottom of chair-ing or tehle-ing, and then by an eighth from it looks fast in piece, after the shank of the caster has hera acrewed in or out until a perfec-uffestment is obtained. And then ye adjustment in obtained. And th

Wind-Power for Country Hou A NEW type of windrell enables resi-A dents in the country to obtain elec-tric light and power at precisely ne-tric light and power at precisely nerost for sphery and maintenance. The wheel is exported by a single spor-schiol is nigoted at the lower and Breewhich is present at the lower exc. arre-tion is very easy, and also repairs, etc., as its whole structure and wheel can be wrang down in the ground. The con-struction of the wheel is need; a wire-struction of the wheel is need; a wirewheel studies to a cycle wheel forms the learlyholm to which current steel h

accration, in varion crives does inside The Options is bound in a ventiley proof enable and mestated clear to the shorts, a children of redirecting the en-merties. The entirect to it privated on a time to the contract of the contract of the sound of the contract of the contract of the contract of the contract of the sound from a hidden by assist of the sound of the contract of the contract of the sound from a hidden by assist of the sound of the contract of the contract of the sound of the contract of the contract of the sound of the contract of the contract of the sound contract of the sound



Treating old ties with press and S-irons to render them again ser-

just about as close together as they can be placed. This means that their units offers or samely thin off to neithing. These thin copys make it possible to make the metal of the finter conferm to the opposite fitting, the thin metal-crush-tes down alietate for this necessionalistion. Between these edges the resease in held where it capped events. Testalistic shown that these juition are as efficacions for our as for finble.

The Decoding Typewriter

H 1633-8190001 central and deceding of III cabb messages is necessibled by seats of the assessibly of two type-seriors, electrically connected. As the operator rans off the sigilar message on the one, the other types out the code-workers. When used at the receiving out, the order of hittings is enversed, and the could message as taken of the wire in fed into the one mortiles, while the other mertily types the decaded message. The two markings, of came, have their beginneds electrically that together, ac-cording to Just what made to being most. If it is desired to keep this code secret from the operator, the second muchine may be in another mean. The apparatus in being exhibited at the institute of

A New Jazz-Producer

A MONE recent employs to-critica in a tree instrument for the production of Maureci just oberts. As the photo-graph indicates, it consists of a steel hend, updated wideh two happeners sizes band in front varying the pitch within surprisingly wide itselfs. The operator's



to an edge at one side so that they may be driven late the grain of the wood addresse. If little emporates such as expense. If this employed age to this could be applied to our whole reli-way system the cost of the freighted goods everyone buys would be larger. It is very difficult to enforce the spirit of economy in a large factory of any kind; while if the factory is moraed on over handreds of miles, us in the cos-with a railway, it is still hander. The differity is to make tern see that the No. rich mercean has merceanding longs expenses, and that the need of little evaluation is an great or it in its

The Last Word in Motion-Pict Screens—the Multi-Power Projection Screen

the case of the indist

EARLANE interests in weaper beture projective in familiar with the silvator made in the design of servetor rich sheet, the witte kniestiget surface and the metallic semi-refer es, all receiving the relacials of fiffure reflection, the law command sur-flere being about their those as bright with a given projection integritant as white matt suctores. The latest contribution to the art in

the multi-power total reducting arrest requesting a highly policied attracture on desired, where the pirture light is specially and not diffusely reducted. This high brilliancy is obtained on the

two experience at which the sound referen Insteading at which the swile response fives the belieu returns in phase with the world emitted. The third determines the interval became, two short signals such that the sche of the first arrives at the senior at the instant that the se-end is entired. Depth curves obtained by these aethods during the voyages of several of the skips of the United States Navy are given and they agree closely with direct somethap. The Adjustable Caster

CASTERS of the networked model have assessed finite. Sometime they are rigidly fined in their sectors, a tlot they are stable to compensate for that they are unable to compensate fug a short leg or an uneven suct on the floor, and the table or chair can be look one, the two tests or cour rea to a on an over level only by porting so thing under one leg. On fined familia perhaps, this has no other disadvant than unightlines; but on rolling it military it means that the block mast mered and replaced every time the to is mered. Then, see, who has not a meter that neck too solid hold of curyet, so that presence on the sisweety crampied the curper into a least field, and finally, every homeout known have easily the plain, unadorted conter of a by-game day drope out of its archet when she after ture about.

THE RESERVE OF THE PARTY OF THE

The Transatlantic Voyage of "ZR-III"

How She Will Evade the Tornadoes and Storms of the Western Ocean

THIS hopes of her builders are realised.

This Lift, the are Supprise recently completed in Germany for the United States, will said for this control white half set this control when he had not in the early part of August. Although the skip inself was completed cares made the half being inself was completed cares made to post of collaboration and the control with the control wi or point of reliability measurery to justify her entities to on a transcenante wreage of at least 3000 miles, the weald be the length of the trip, if her course could hald out on a great circle; but, if, as is quite possible. aid out on a great circle; he should encountee one or and to changed to avoid to carried to the circle of the circ

Intilities. Tragates quasars, as were the masses ser-ferory and passe destructive, are notatively of nen-recurrence. The extentinglead quickers, which are those the "\$2-115" will be mare likely to more, non-lative edimenter as great as 1500 to 2800 unline, although the strongs size in believed by our ID dragmagate Office the surrage size is believed by our By degraphic Office to be between 250 and 2500 miles. As-vorting to this authority, the stream move, shows without exception, in an essaying discretion, though at these white curror say have in it a north or sucth companys. The longical epolane, which meally originate in the West Dalies, are smaller but at those of an indescribable ter one or more storage her course



which they gained in air-construction during and or the war. In her half for the way. In her half sign perficular uttention as paid to the lengthelines strength, with a view to exactly that building of the hangitudinal members little proved famil to "RAS" in the 13stl disease. It iting prevent thirst to "Room in the 1991 channer, in by be gold that, considered as a framed structure BLIII" is more rugged than any of her predicements, to bor has been designed to resist such a scalar side rugg as your loose the more-my of "Shromaticahi"; and thrust as tore loose the mose-up of "morandous"; and the fin structures salern have been built with a wider have and of stiffer construction than is found in earlier

https.

The discretions are: iritath, 690 feet; discrete, 60 feet; and opacity, 2,472,000 cubic feet. The neither power consists of the 400 temporer. Declificher actum, which will give her a creditate good of 65 filles per hour and a santiation speed with full gower of 700 asiles per hour; and a santiation speed with full gower of 700 asiles per hour, and to santiation, and the full government of 60 miles per hour, and the santiation of 60 miles per hour, in 200 miles we obtain a single per hour, in 200 miles per hour, while a unit per hour per hour, with a unit per hour per hour, with a unit per hour per hour, while a unit per hour per hour, while a unit per hour, and the per hour, and t

the third below in the controlled of the control

to the two prompting should rharts it will be seen that, while the empty of their cyclasic dismercial fring between the two continues.

terbative more over bread, curved over-us, the white themselves have a rotally movement about these conten-A part of the implify of Seppelin plats for some years has consided it unking seculed "spatietic" flights across the Atlantic. These were instituted by Contr. Seppelin, who had plaqued to escape in conthis plan, the log books of storage costalns and of

This chart shows a steem of the Estitid Iales. "ZE-HI" lays a excess to pass north of the steem, where the wieds (revolving counter-clock wise) will be westerly and therefore favorable

effected and charted; so that a pilot in training evolucollected and charmed; an chan a glot in trolling could be manigard to make a thousand inmovinization rate, as of any prince that by the past, and world have below to construct that the form have been constructed from the country at that them. More than in the second of these insugatory flights have been made by Eropello price and this is now part of the training of the area at Prodrictabulant who will be found to the country of the coun

in a necthresterly direction. The pilot, therefore, rides on a northwesterly contrar, so so to carry him to the north of the storm and tabasis be run into it.) which its outer and favorable susterly helt of winds Later, he learns that stather disturbance is swinging down in a settlemostrip direction from the Laborator cost, and accordingly in turns and maintains a course well in the south of it until he peaches Labeture. On the other than mre shown two storms, one traveling method of the northwester exact of the Britis leies. In this case he have a straight course for Lebesture uptil he le warned of a exclusive disturbance which is rewriting of the negligenters count of the l'allied States, and accordingly he swings north to get Palled States, and anverlingly be swings norm to get into the fiverable nettherly quadwant. It should be that the fiverable nettherly quadwant, it should be forted that become of the receivings of the regist po-ports sent set by the various weather because the lifes, so starting, is in possession of a general inservi-elege of waster conditions. Other clear of the count, he is more deposited on his son resources and he has a hearts with the sitema as they come although our

to learn with the science as they come, although, even shourd side, it is possible to make reliable positioners covering 25 heave it advance.

(1) close every, hereeve, are not the only network hadron problems that seat he not end solved by a reasonisative alreidy plan. There is the thandeencess

mutaminate abrilly pilots. There is the throdemous with its derive and sation goes and appoint in the with its derive and sation goes and appoint pilots perform on the first the English pilots perform not from obstruction of their ships for lightning and they will tell you that they have proved through electric stream of the greatest intensity, when they ship and provide the ship was struck for agreed an agreed to

VIE question of the incharact of modical upon rate

This question of the influence or wassesses with even full in a very sid one, set it entire the wild even to be fully answered. While there is indisposable A file as a very the one, per it course to indisputable gave to be fully stawered. While there is indisputable evidence from all parts of the girle than the reckbes descration of forest-growth has brought progressive instruction of hero-growth has brought progressive determine in its train, it has stly comparatively to-nestly come to be realized that the problem is consti-tially hydrological rather than meteorological. When indeed, one reflects that a forcer is herly princelly at adaptation to related and other citantic conditions. It is somewhat surprising that the earlier investigators should have expected to find outsiding never than a secondary traction of the forces men rainful. No dealt for rienarizated type of ficest prevailing in

toloing the insuldity of the afreeghers to exactly, if not slightly to increase the rate full over the year as-conpared with detended tracts, but, or the other hand, recent referret and week are een pand of draught-moteling species, reducing transplicative to a minimum, a distinct in croser of rainfull has full deforestation.

It is, however, as a hydro-logical upon that forests play at increasity important part in conserving moleture in the sell, regulating the discharge rivers, and in general mulifying the pattern death not of a country. It is notice factory to find that this decree

HIT lays a course to generate clock wise halfs a very complex prob-lem in physical prography to saids the course of the course It has been shown, knowers, by an emporal elegatel-egist, wen lients, that forcests do very decidedly increase egie, was liste, that nevers no very declaracy mercas "nantal?" in the broader was by collecting the moistur of Sag. This is expectally true of bill-day and mannatal of Sec. This is expectally true of hillday and mountain site. Uplant for is, by its different mode of origin presently wester than lowboad fog. and sa drifting nersell verifie that switch tog, and as critical across wooded inventible skipes deposits inter-questilized of invited from in the drier lowing freedomed by residents on rold nights, there is a constant

A Neglected Well of Information

The Unrealized Possibilities of the United States Patent Office Files

By Karl Fenning, Assistant Commissioner of Pasents



Dated States Patrol Office was excitisted in 1996. The first Chine State parett was board in 1700 in tagentary of large pared to carry out the worker of the Constitution stick netropiated the encurage rant of the arts and advances rights in their browthese. They are

rivel succession. Most people are sensor of the fact that power would five new is preditionly or when a bright idea to described the Patrict Office should appropriate for the sale of circulating protection. erdingry attitude ownerd the Pubett Office in that of the width individual who feels that he is percuring the bisself exclusive rights with respect to his own individual device or investmen. From the logisting, howties of the mother. To be sate production in given to we designed had lif or elitary by him only all complification at thereo, he is a province in one only or reasonments that he make a sufficient written disclosure of his lawrening to proving his parent. This disclosure is examined way corolled, he the Patient Ottos to see that it does give a civer uniconsiding of the new thing. The purpose of this disclosure is to itsure that the green public stell know how to use the mornion after the given in the investor. To this end, the parent is given to the minimum to this end, the workly Offered George Including all belong in also

nntibleted This may be subscribed for at \$7 per year Actual manufacture of the invention tory trake it families to the nobile. A ters large assister of patricia, however, are bosed on incombine which are never office bears aris to mempfarturing and setting his device. It may be that expitule is not available for its promotion; it may be that the invention is shead of its time; er it may be that before extral newperial spention are meditated attraction of the investor is diversed to were other line of endergon There is, then, in the Fulled States Pasent Office a

is not always andled of. As regreted above, when something has been perregardly the producer carries his new thing to the Parent Other in the hope of obtaining percention. The professional investor or designer, as well as the ordinary business min, bearing, might nerr well amili blaself of the Perett Office at an earlier stage Paints Office records are open to any tunnier of the There are about a million and a half lighted States patents alterally bound. In order to make them perfull available, they have been exceptive classified by the Priret Office late about three hundred male classes, in which there are several thomsand subclasses. It is, therefore, generally modifie to find assembled next of the patents relating to any field of endeavor All patents are printed and organ may be obtained at ben critic each. The Patent office laws a first of cluster with delighters, all of which is changed from time to thre as the arts progress. The classification is one wently charging to previous nonlities. One who is about to enter into manufacturing of a new device or a new lite, even before proceeding with the prefindings; dright and development work, wight well amount and breedhate the patents in the particular subclass in which he is interested. North time and energy denoted to neverth and experience may be thus avoided by safet the experience of others who have absents seen

knowledge which is available to the public, but which

Note an innestigation is reliable from amoral stand-elais. Pirel of all, it will show what is disclosed by patients which have excited. All this nation is open and free to any narrabor of the public to be used. Such and free to any narrane of the patter to be more, when a search will also show what is still exceed by live patents and so indicate the things which should be gretfed as not open to the positio. In in frequently possible to obtain some such pattern, which is not being possible to obtain some such pattern, which is not being worked, for a trestant same and three province a ready made entrance lots the industry. An excellentica of the nations is a close will also extend to remain a size.

ber of different ways of approaching a problem. questly, used appearant work may be availed by seeing what has been attempted by others and by our parting it with the things which are actually in the market. Few people would shall their eyes to active competition in the market to the extent of per investi enting and not knowing a last other meta-faciones were production and willing. It is equally important to know what effects have decired or tried and not exceeded with, and frequently the only manne of this informa-tion is in the Payers Office.

In solition in Thirse Nature research a valuable

collection of American and Serian textinoise and architect jurishin, the technical literary of the Paper Office has naturals of the principal fersion countries of the world and an investigation there is possible to indicate what is being ditte by Societies. This is the only place in the United States where region of all pat-lished Seeign patents on to found. This is especially useful and hapartent when it is proposed to obexpect field and exprete with free-inners, but it is also of useful interest as it gives the needs of the density even and investigly of tel metric our own citizens, but the next setter salpds of the world electrons This great storrhoom of information is used freto record the prior art so that a patient may

O'TP. Power Offer is reproded by man of an an insigh the agreement of the power persons. The ofference is a person from the power persons of the other persons that it persons power than developed. In the enthrolia of Person Offer is associated on the person of the per

not be held to every more than it should, but it also has great persibilities of a positive character to give one the state of the set as a franchities for fred ris concerning the distribution of for are taken into

land, in the year 1921 and gain from them to emation as to matter not covered by United State pulseds—said so rive to use use or our parson, as one indemnation were assembled in an united volume ar-ranged and classified according to subject matter, manufacturers and investors would have at their band a resely means of ascordating what had been published. United States.
Publication of this information which is after all

Ficklestins of this internation which is after all transfed in header the public will probably be accom-plished only when the Government is willing to do a result for the artifests and mechanic and the main-facture as it need to do not the farmer who whose wheat or play. We does for the farmer who whose wheat or play. We does for the many it is growpard of does hopes, rowlvinde beings to sait and norther of does hopes, rowlvinde beings to sait and norther

Antarctic Sea-Ice

THE study of the Attacetic lenguish may be an I prosched from two distinct polarie of view. In the first place, we may consider the movements on a large scale, its distribution and direction of drift, its forms the and its affirests disappearance, and the proper leaf bouring of these matters. For it is the proper of the inequals which has finited the exploration of Antarctics, and no future attempts to each the still unknown results are likely to ranged colose the known

arms the received of the give taken as account. In the second place, we may receive the physical aspects of the pack-les, the growth, the changes of attractor is underpress after its formation, and the cusaws producing the breaking and motion.

One Inquested point which has belearned from the drift of ships which have been been and carried with the lev in the there is a considerable washed; component in its motion. The chief matter power of the drift is understeedly the want feeding down from the confinental levelors, which is pre-raily sugil-enterly in dirand so accepted for some of the woman's responent. In addition there is a well

marked tendent for the lee to more to the left of the wind direction owing to the rotation of the earth. The actual direction of the fre-drift at any place is to a large catest governed by local circum-strates, such as the presence of promutation or loc-tingues. But for the newlighter it is very toportion to here in united the powers wester to recover any

In considering the structure of the park, it should be remembered that the growth of the window's lo-munity starts in a sea already covered with loosely marked fragments of old live which the part lee con

model departs of the work in two the content of the

The product of the Patest Office have exceeded the especializes. The relievant and publication of the valuable information has contine descriment sorbing in delices and cents. In spile of the small amount of money exclision, it has been prestile to do much. Poemany trimmen, it is not present to the tipe, yea-shly if the appropriations were expended—even to extreed the free taken it—it would be possible to re-view, dignet and dissocitative more throughly and more widely the subject matter covered by the patents. An invention discarded or rejected by one potential may become the outpressions of a great industry in the

sett grantides.

A paint lasts for 17 years and the matter to A server mass or it years and the masser stretched in it is, of content, availed by the yebbic during these 17 years. At the expiry of the patent, it is precedingly from table. If the Convenient, however, would provide the proper funds, the Patent Office might lever at matent indicate its arrunnile language setting. out the development of knowledge or stones by the ex-plined patents. Such a publication might then indicate what stricks well had been made to the free Sold during the past year by expired patents. Some such lifes was that the annual reports of the Constitutions of Patents should include a list of paintin explined during the provious year but the list was rehibled in a fr which was not nectivalized uponed and was consequent

in their days when the other departments of the Occurrences are going alread for meanth and investigation, it is accommand emprising to find that the effect has been reads to provide the Patret Office with finish has been reade to provide the Princet Office with finds to relieve and publish information in the wardous arise with memory for fermion motions. A development may prove a relevant in the Unified Patrices on the same mactive course a relevant in the Unified Patrices on the same mactive course a relevant in this fermion patrice. For his application to this septiment in the second of the fermion patrices of the second of the fermion of the second of the fermion of the patrices is second to second on the patrices have not to second on the patrices have the fermion of the patrices have the patrices have the fermion of the patrices have the patrices have the fermion of the patrices have the

Our Radio Page

Listening In on the Latest Progress of the Radio Broadcasting Art

he Art of Tuning the Radio Receiving Set UNING the receiver—a rather late day to be telling I several militon listeners to be to bundle their set!

Tree, but there are ample indications that everyone does not yet know how to take a receiving set and, want is much in quite beauties in the loci. An explain of noises that socializabily man six radio programs are due to faithy taning. Indeed, the greatest technical problem of radio broadcasting is the citatination of the spearing, greens, shrinks, whisting and "hiefles" in general, which interfers with what would otherwise be

The cause of these unbecausing noises is rediction By that term the radio engineer means the transmis-sion of radio energy by a receiving set. In the tensor re-secuent tide receiver, appointing of the world-instear re-sponserative type, if the taning is carried beyond a conis point the tube to lotger aris solely as a receiving tibe, but begins to function as an oscillator or generator of radio waves. In this oscillating condition the or to regio waves. In this occurring countrie the relying set now become a ministery transmitter, and not out a west radio wave that our be detected over a distance of a quarter to half a role. This week wave, or radiation from the receiving see, is picked up by surrounding sets turned notes or less to that same we length. Just so leng as that weak wave is to off. It preduces no noticeable effect in the surround therit. It produces no indicensive effect in the survoida-ling receiving sets; but as seen as mostler ware of practically the same ware length to received, the two waves interfere with one another and produce an auditie sead or "best note" in the trieptone mentions or land-speaker of the ratio receiving sets.

No matter how elaborate may be a receiving set, it is subject to the "birdles" of nearly receiving sets in the hands of excelose operation, just as the mointed on the pothic highway is liable to durage and injury from a careloss defect. In fact, there is a striking parallel a cuream arrow. In cito, tower is a strong parameter between the padis breadening situation and the highway courtesies: Jast as instorties have learned to drive curvisity, diss their lights and, in general, worth out for the other below's welfare, so raths extination are for the other fellow's well-tre, so rudo outlinations are instructing that I pays to loop relate set from outlinding and interfering with the reads eclayment of others, because by no during the radio atmosphere must expertantly be made ident for computer. Both one generated manufacturers are also wereign to the end by designing and instrubetation radio receives that well not readile, an antiture low they may be that well not readile, an antiture low they may be

handled, encouring set most likely to radiate when the properly mand is the starple less highly efficient challe-directly requested by a lighty efficient challe-directly requested by the less than the set of this true, one being interest as the set of this true, one being interest as their or "interest likely likely and the less as thicker or "interest likely and the less as their or "interest likely like

The stagle-freedit regelerative receiver is, understanding, in order and repete today because of its relation possibilities. Ver here is a circuit valide will reach out further and jide beauter again response than many of the parse elaborate and noise certify circuits saw in our. Whose properly tasted, it will not relation. The first step in its proper manipolation is to set the craking at zero, and then their late there certain is appearable to be extrained to the certain the specific setting where one capacits to the their desirable signal, and, with the other heards the incident certain in the contractive of the certain among the mining statem on receive a size of the second conference of t

natrols, use being the station-winding work. other for builting the eventuary or tale chrust, and the requiring one for reprinciple. This type is known. as the three-dentit representer review and in highly selective, although it requires excelerable skill and patience to get the maximum results of which it is capable. Since this receiver has those controls, the general tendency is to set the tirkler or regeneral central to manterers, and then ture the primary to mel segmently still the subjective the resident is conting station in heart. All this while the resident is sending set an interfering wars, which is playing hower with nearby radio recolving wis to the dispost and

netten of neighbors The way to operate the these controls of this recei ing set is to chart or collients the secondary control hash for various ware lengths or visions. In some cases the nontralacturers supply such that for their receiving sets. With this data on band, the secondary nd is set for the approximate your length or th station desired, releasing both hands for the two re-maining knobs. The tirkier or represention hash in instaling space. It is there or represent the services the services the primary or startes selected section of the section selected in the defined segment. appropriate extend that this type of rewing should be used only when it is at a sufficient



How the stage manager of the radio drama supplies the "meete" effects

distance from other sets to produce the possibility of interference, while other radio authorities rights that such a prefere can be padde to pilate for radiative and is note it twee destroye in crowded localities that the single-circuit regression review.

It is the regressifile review that is blaned for rediction trackies, while other trace escape contents. reflation treables, while other type swape reasons, as pub. This between, is much; and is based on an incomplete involving of multitude produttines. Seek in which redshipmanty amplitudes in employed are senseting guilty of reflation, because oscillations and be set up in the amplifier tests. In the better types of radio-frequency reactions the oscillation technicals are executed by a publishmenter or stabilists section or by more neutralishing device, such as the tiny next trailing endowers of the well-known are trailing endowers of the well-known are trailing, as it is accepting railed, in application for a practice should reemetions called, in applicate, the operator should be emained at what paids the prescriber or excitative is placed for mannes the whole in this each places or load-operator, and silvarps more the productioned on to that point before adjusting the familiar extension. The simples makes by which is not whole or state in well-state or set in a rap the and sectorist. And of clotical present is not included that the con-incident of the contraction that the trans-cribe the section of the contraction that the true is reasoning the regimental point. Moreover, the con-traction that man which is proposed in our sharp trains bed-care clotical the same which is proposed. est of the receiver, but the grid is the only reliable

union. If one officers the set too for in reprocesthe signals become mostly and indicator!

It is essential that all of us strict to correct the power radicing out which is rolling full radio on person radiation out writes in resource. Specially in Speciall for itself radio likespecials, superiodly in crowded sections. Not only must radio sets be raide with the rathform registion produities, has environ or heren love to take any receiving set so as to pre-

Protecting Tube Filaments

FIRM a reserve Frederick A. Mereta of Philadelphia ment in ingrices like for protecting vacuum take agh meldental report or missianed comme finise. All that is necessary is to secure a 110-roit 16 to 50 wast tangeled filament bulb and socket, and connet some in the 2-battery treat, in serios, of course Ordinarily, the 1-battery every flow though the pers flanent of the hull without the latter showing signs of such current day. The resistance of the any sides of sach retreat fire. filment is insufficient to choke of the high voltage law carrier consumption of the usual plate circuits. ever, If the unity reuses the Bi-battery extremt about be streeted into the Abstrery leads, then the high registance of the halfs will insmediately serve to the off the suresite fibrillary current to the exists of protecting the vectors take filaments. A carbon large serve to give as good results as the caugeor The latter lights such refers there is a short of rate or improperly recovered it-bottery level, with oursel, and a source made for the cause of frouth

The Scenery for the Radio Drama N order to make radio plays more real-tie and piec

In order to make these pages more research to beard the preciously altrosphere, the special bell board If the incomery assumption, ore special should in the accompanying slew has been test for ne-in the Will study. The beard carries a dust bell in the WGS stadio. The board curries a di telephone bell, rivek slarre, too belle, buster since hell, sagether with the operating post-hattens and dry cells. At the left is seen the periable door. which is placed nour the interspixer and server by farmed the seconds of a deer being spen-d and rhosel even to the bandling of the keys and femiling for the The adventume is beauted under the affishade of what opposes to be a floor large, for the sale the trapeturent of the rath players

Can the Neutrodyne Be Improved? WHILE admiring the numerous advantages of the

W neutrobae, especially so a hoste circuit, it is fair to consider what can will be done to this circuit to pulse it will better in the fatory. And no one is better qualified to perso an uplation on this question than Prof. Happings hisself, the designer of the neutridate cirtimediffe mineri, the designer of the neutral pro-cult who writes in part as follows: "Probably sizes others one who has corrected a neutral pre-ting his secretary of the property has potent that the three tuning disk roof nearly affer for each ways bruth setting and has hed the idea that three three adjustments might better be made sitted innecesty by greating the diale together, or, better, by unexpling the power of the three tuning conference on super shaft. If this could be successfully across plished, tuning would be varily simplified, and if would le improdiée in you through a station which was benedenting without hearing it. Two itentations have percented this desirable arrangement to the past. First the manufacturers of confedence have not accorded in making them sheekstely uniform; and, secondly, tures buy employ scotters of various especially affecting the tracks of the universe circuit resupposed in oursembling the first difficulty and in edjecting the outdetones to agree throughout their stales, the sweet difference may making the antenna a part of the set. This leads to be an arrangement which we may imagine as the life. alrestyte of the future on the law unit recented with the hattering most the top of a cubiast three or firm for high and warding on the flow, the absence on sisting of a vertical and extracting from the revelop mult to a metal sholf mear the fiver level. . . Need a net need have no external wiring whatsoever at could be relied freely around the floor to any desire

The Sugars-What Are They?

LATMAN generand assets or our size regard, the kind that he sees in life ton or cuffee; the chemist, an the other hand, knows this too clean of substances which he cults the sagara. In other words, there are muty substances which be to this class, although they are usually known by dif-ferent names and although only one of these is properly of sager in concess pertuber

There is a rather interesting story in outperties with the first appearance in Humps of the substance, sugar, which hears resulting. The directs, as was their cun-tons, had a story to told about a wandroom need which juided hency without less. They were fami of such sales and cared but fittle if they were true, just so long as they were interreting and entertaining. They did not believe very much in this one, but it happened to he true, for this mentions reed was mething else than the segar rate, which was known at that time in the Par Kost. It was availably brought into Knows by the segar rate, which was agreed in the time to be Far Rust. It was eventually brought into Kurney by the Araba when they invaded Stain and was called in

This is the reason that is known to appreciate and was for a long time the only sugar containing comments. Obstolently, it is called survey and it is the sweeter of the whole want family. It was not until the admiteightweith century that a German chemist comthe idea of entructing ragar from the sugar This is now a great industry both in this coun

and abrood. Seek supper, as well as cashe supper, in systems. Great quantities of these seques are don-stanced early reservational through the seques Dist, as has been mentioned abrook, there are other ha-perians received by the supper handly, which has not characterised by a sweet seads, and which are supper-

concentrate by a week state, and want are separa in the suite chantical needing of the word, her which the layance knows under other names.

The need courses of these is glaves, or destrote as it is called admittaging. Glarges, also known as graps sugget, is not us sweet as signess, but is just as good food as the bitter. Storone, when subjected to obser-ical freshealt, can be made to spill up his two singles separa, one of which is desirence or placese and the other is hourse as breakes or frances. These two

the property of turning the plane of polarised light to the property of turning the plane of polarised light to the right and the other to the left. the right and the other to the left.
Gittore is the sagar that is note by cheateally the
ing starch. Own starch is connected experience for the purpose, although points stand may also be used. The stands is irrested with dilute and, the latter being distands in treated with ditars and, the latter being on-their pressed by after-construent. Offerers in the sager that is received to a large critest in making confine and anti-default, it aims he becomes one on, for communic, in the manufacture of chemo-transed leating, or an imprefient of certain for figures, in treating thinces and otheren products and the life.

per that is front in home relaily from invert mann, vi-glacese and fronteen, not on

matters.

Lectors is the sugar that is found in milk, I obtained from the whey which is het ower in manufacture of chesse. But lectors and publish keptly used in making minut foots. There are engree, such as manner, gathering, milk and the fills, that persons only according interests are not made on a large color nor code for any age. purposes except to some cases as used

A Marine Truffic Policeman A Marine Traffic Policenza.

A Marine Traffic Policenza.

A Exproved CEEK, between long island City at

N Brooklyn, is a very long waterway, and to one
carre time of tags and zown, a narine "realle" officehas been appointed and the results have been association

ing. Regularization is printed form are given to the
masters of all certific aspicating the cross's which results
in most obligationistic or confinition and older.

SSEE are in the main ention, illness, sife erigin, that Is, the fibers are derived from plants that are grown either whelly or in part for the illeress relatinger that its obtained from them. The last two ups of satural origin, wood being storm from the elsey, and elik being women to the silk warm. From these four fliers, to which may be added name, beam, and one or two others, there are obtained the moithfule of fairfes that are employed in the analy ing of riothes, revertage, and the many other purpo

to which trattle materials are put. How to tell between the Obers and how to determine which of them are present in the finished tentile is indeed a undergreated the ordinary individual finds bard to moter and which nime has its difficulties for the 190 per cent wool or does it custain shootly? this liben from year liben or does it mends notice as well? Dow the silk material bragin for making a dress creates all sife or in a little come missed with 22 These and many other problems confront the purchaser such and every day. Here are a few simple team while (943 prove of some value to helping the learness to bell hat character of material he in haping. In the first time, whether or her a master fabric is

Textile Fibers -How to Tell Them Apart of the there is at at

If all upd weel is nature with comme, the n If all and wed is related with notice, the presence of the vagatible filter on he ried by the nee of a solution of patch by. This will disselve the work brines have credited behalf. When a citil communities in the will behalf. When a citil communities in the will behalf. The communities have been a solution of the cortine in the cities the will behalf. The described withouther a tradit leader in 100 per cent limes, the following tent may be applied. A straight of the cities in the in a limit overcomminel, attricts of the cities in the in a limit overcomminel, attricts. of the civil, is left in a little constitutely splittle sold for a period of que and on-half to been pittable. It is then nesseed gaid vasiled with water and treated with a selfation of custom-level. The custom-leveline attacks the cetter and leaves the Razer unbroaded. The presence of the cetter through a sawing the little file can easily be tell to the gape that are left in the fallet the to the remained of the former. In general, gained there can be differentiated from the reputable fibers by testing with acids and situation.

100 per cent word can stale in sold by the their of the species with respect words of the species which regarders equivalentate regarders, or by the species with results for the species with Alloades will strack wool and all and caperro trace there, but will not have a charge offer, or extra and lises. On the other hand, order will disactor coints and lises and will not effect well and all. One way of telling the difference between cotten and lines, when it is uncertain what there the tabele is made from it to tear a seguel. The one is the labele or the state of the second of the labele of the label some, were it in convenient was lover the state of much from, it so there a semple. The court is the falls will leave straight threads if the fallet; is them, by custed threads if the fallet; is cotton. Another on that may be employed to determine between cotton and lines in to allow a drop of giperities to full on the fabric. If it is cotton there is to change pro-therein, but if it is linen, the fabric is made

Curiosities of the Post

OUT of \$2,000 post offices in the United States there
there are 28 washington, 22 Clevelands and two Discages. Name
like Oliston, Cherier, Levington, Outburghous, Anne of Procidents are numerous as are names of the world rapitals. "Pency" names like Stavits, Aresis, E. De raphtum. "PROOF technic har played, Arresta, Ed rada, etc., seem to be prime havefree. If you put ". Tork. U. S. A." on a letter, it is sure to be delive and by burning. The berning ner is perhaps the sixuales. It morely consists in inchine a after of

beary, with metal. It When Is jujer it deposite u grapish block strenk. lend is a nexal that has been used for a lend is a newly that has been used for a long time, and when the salestane commonly called graphite, plumbings or "black lead" was first employed to make periols, it was natural that these writing impleold have been railed lead pencils because they left a black mark on paper. However, there was not a particle of the notal, level in them. Thus we have the common misoreser, "feed persell," and many today still think that lead in used in the "band persell." Lead is a rotal of resty uses, but it is an entirely different attentions from possible. The latter is found in the earth lest hever in the pure condition, and in only a few localities at that The island of Crying is finned for its graphile deposite smooth other things. Neartn all of the smooth that is used to this country todays questity of it is expensed for various purnower to made by an electrical process from anthrocks

tionships in singly a bear of caring. Carles is a Mobile legaciant chemical chemen. He send forelies form is real, but it species in order a number of difpress to read that it represent to denote a nature of the and nothing obs-but entirely different physically. Thus, the discoved is a firm of carben, as is graphite. Title, the comment is a norm or reven, not as graphen, which is a block, opeque cub-caree with a metallic layers, possessing different decrease of handsons. Char-coul is curtou, and so is cole, and guala hamplanch, theobstance that is obtained by furning all in an in-

D is known to be a write and the start of th rediction supply of ale or expans. In the fateure is of the electric and, these minimators are expable of be of the showing and, there substances are capable of being contented one him the other. Graphine is used in making leyed profits but this is by no means the only one to which it is put. There are many other purposes for which it is put. If there contains the amplement in the selection and although intervals on the content of the content of the intervals of all faither articles. It pussesses the lin-tervals of all faither articles. It pussesses the linpercent property of being an expellent road etrie carrent. Couplifie electrodes are made in all since and shapes, from the small once that are employed in the electric are light, to the large once more than one foot thick. are light, to the large ones race than one foot likely, that are required in electric frames were. Various parts of electrical mechanic are under of graphits, such as nonassistant brashes, more and generator parts, modes for electric hatteries, etc. It is exployed to a certain extent as a scheduler, etc. It is exployed to a certain extent as a scheduler.

If has been from! that when averbile in very finely If his been found that when graphic is very finally extend to give an imposphible powder, it can be triend with either water or oil to form a suspension which possesses important inhericating properties. There the explicit companions are now employed to a contider-sitie decree in inhericating translatery, the great in extensivities, on

company also disks employment in the material of block provine, particularly to making ap-province. Graphite pulsars are consensive and

occupations, it gives part parties of fertilish to as an imperient of fertilish a holier occupation present the increasing a holier occupation to present the increasing believe with scale from hard waters. It is employ in the assumptions of credition which are send in his temperature work, as for features in the manufacture of creditie steel.

The filter of the Figs.

PATION classes for Children file.

PATION classes for the Children file.

Consider and the selection of the controller and considered on the controller and contr The Size of the Fing

The Service of the Chemist

A Department Devoted to Progress and Achievement in the Field of Applied Chemistry Contract to 19542 (200325), Owney 2s

salam Diexide from Bauxite A NEW precise for meanthethring the A important white pigness, singular storids, which has now definitely joined the runks of the white pignants on-played in the manufacture of white

hits and similar products, is described British Paper, No. 181,775. The n British Patent, No. 181,178. The arching material in this manufacturing access in the universit beautite which is used in hang questitism in the mustifica-ne of the metal, alternitum. A min-ne of one part by weight of flushy firthful juzzife and five parts of ma-phical parties and five parts of ma-mail and processing and the parties of manufacturing and processing and manufacturing and processing and parties of the processing and an architecturing and parties are also as a superior and an architecturing and manufacturing and architecturing architecturing and architecturing and architecturing architecturing and architecturing architecturing architecturing and architecturing archi Cottignale under a presente of from three to four atmospheres. Austrella and matter raper are evolved, and double relitate of amounts with atmittee and from the research. The nature is then treed with water to dissolve out these ratioses, and the said to be a suitable and the calculate districts. In the calculate districts in the land to district to the calculate districts to the fourth of the calculate districts and the calculate of the calcul The pigment, thenlan discide, is shined in the state of a very flor rospension in the solution of the sulfaces, and may be decarted from the silfes and the undisenved battein which settle to the betten of the reaction vessel. The an distile may then he fittend transport course may then no science. The process is said to extratile for treating beautite which is rich in th-instead discide. Such a product is ob-related to certain regions of course.

Petroleum Products from Slime THE Reserve Organization of the Series Government has been investi-gating the possibility of abusining size gating the possibility of abusings of a std other products from the sline which is found at the bottom of the lakes in Central Raule and Turkeston. It is stated that there have been successful in stated that they have been successful its distributy eventage every product usually associated with interest oil deposits. As-suring that the metamentals, it will be strong confirmatory entirees for the registed theory of the origin of previous deposity; though the conservain subse-ce its discreep would appear to be to regal—the Obendon Jay of Lin-

Pure Hypochlorites and Chlorate Pure Hypochlorites and Chlorates A NEW method for the production of A pure solutions of hypochlorites and chlorates by electrolysis is described in the Semberty four Electrochemic, 1924, volume 30, pages 67 to 72. This is ac-complished by using exclusion which con-tain the metal chromizm. The process tain the metal obramian. The precess seems to work out very estimate of the seems to work out very estimate of the desiretic face what results can be se-cered with it in large scale operations. The will depend to a large estimate on the dynamistry of the iron cathodes which are engineed in it. If they can be noted to issued up suptact the com-view scales of the abstractic establish.

repressing Agent for Leather Waterprecoding Agent for Leather: IAXVIIII is readered waterprice with-Le set Experting to it greatment or foliations by a process which is pai-sted to thebod States Patent, No. 1,403-rit. The leather that he produced in the resigner is claimed to be estimately officially by measurantees that six soles. affe, rosin and rollier, preferably raised with a softening agent each as career oil. Coloring marter may also be added If desirable. by weight of penuffit and main are melted tegriber, heated to shout 30 de-grees Centigrade, thoroughly retard and the root is unified by blowing air or oxygen through the mixture or by treat-ing it with a not-passons emiliaing agent, such as nitric sold. The exidetion

aged, such as storic and. The moments causes a precipitate to face, in the mol-ten painters. The molten supermatual liquid is then separated from the pre-cipitate, the latter ledge rejected. Then cipitate, the latter being rejected. That is eighty parts of the malten liquid them is dissolved ten parts of thoroughly used ticeted crade rubber by stirring the rubber in small particles in the matter mass or marriculing it in the presence of the or marrivating it in the greeness of the melion light. A settlent is middle to the unitare-sister before, after or dis-ing the actition of the realize. Here parts by weight of caster of have been found to be sufficient for this purpose. The resulting product is then permitted to rest and forms a wealth and which can be adopted and handed without any difference. When to be employed in waterpreading. Storase materials, it, in the becomes late to the milion-solution. first brought late the molive emillion linguistics in effected by single linger-gradient is effected by singly dipping the material in the moltra liquid or allowing it to remain immersed to attain the proper degree of seturation. Ordinary chrone passed leather, for exangle, may be suttably improgramed for sole leather by allesting it to stand in son inches by university is to stand as the another sours for a period of one in two latter at a integeration of approach nativity 55 degrees Centiferade. Book temporation to preferred or higher tem-secutives would lead to laiker the lea-

New Uses for Potaton AT a meeting of the Vereine Gestacher Kartesfeltraviner, which was ledd to the stolle of February, Preti

Preve made on interesting report on the monitolities of further use of the potato. Is well known that Germany had before the war an excess of petaton. During the war there was a deficiency of these and through the Versailles trenty many regions in the cast where point were cultivated have been given up to Poland. Her is solve of this, there are strays pentors that are purily gross, from and to imper metal for eating e, for which a pey behalout a Aside from its use on food, fedder and

Author from its use on food, holder and seed, the posts formerly served as a raw material in the manufacture of alc-hol, starth only year. It was also used to postso drying plants and in the man-facture of hottle still. As has almostly been proven in Proces, experiments in the interaction of the Processing Start fast Standerholderholm on M. Estinish-fast Standerholderholm on M. Estinishreciping to Berlin, have shown that by the utilization of dried polatow a publishe, string beer is obtained. A head 30 per cost mail can be regiment by the deled potents, dried partings being better solved than peters daken. The potent taste and rider completely vendet

or county the work.

Furthermore than dried and fresh po-tation a blanding powder can be ob-tained that finds use in the blending of piece and absolute liquets. Persect meh a blending powder was taske from

the probation of blooding powder the poetrol, receptority notice potation to well on the spelled day potations, and This pure black likewiting powder when wised with oil of turnershee which mixed with oil of temperature makes a good sine polici, as that the show polici industry in also to be taken into monideration as a partners for dried passenge—judantwist out they morning (Nephidity, volume 15, number

A New Form of Carbon A MATERIAL which is said to be to A transdate between the dismoot and graphite is described under the name of "planticable" by K. A. Hotsene tants of partitions? In A. A technical and C. Brekling, of the Charlesteelers High School. It has a affrey white lander. Though elects, it is almost as hard as the diament, and it is even more recolage to chemicals than graphuser reconstit to climitatis than graph-lin. It is prepared by preving the fisses of certain game, such as methans or climination, through small perfection in a heaving approach which to remaining here, such as poresials. The new set, terial lies at nebettle conductivity here than that of Option prophits, and it mention the district optically more than cruckle. Purified by buildar will simily units and finding with sedant sufface. It consides 96-96 per cent of rather and 0.65 per cent of logitudes. -The Cicerical TWGs Journel

Artificial Shellac CHRISTEEN EXITING, per 1804, number 25 and 24, reports on a new process of analytic division by synter prove of mixing error or their redad from accrisic which is first clouged little probabilities. The present is carried out by by Str. Alex apper Waster Geschetath for elektro chesische Zatheirie m.b. H. in Manich The annithrapis is first produced and polymentard by the mean methods that are examined excelered for each parpure and a seft reduces substance in electric. This substance is then poignormed again and thereby converted ordain remailients to the secure sheller reds.

This product has appeared on the Ger tup market under the name of Warket It finds are in the familiar halostry for pribility and productor a dell surface on the furniture, in joints and rulinet-insking in latter work for thready in the grouns and artificial some industry as a binder and couling as yell as in the touch infastry as at adjector to give the head on the match er at attended in the electrodesides industry and in the manufacture exist versides not besistly issues.

Russian Potash from Sunflower CONSCIONS to Steam Service 20

A collection to better seed for the bester in beauty, liveste has been militar the past two years reporting considerable quantracted from the rich wife of southeast on Rosein by berning the stellar of sun. Source which are extendently grown in that region. Last year more than hell a million arms of hard were described this purpose, the stell of pulses brits from 160 to 190 populs to the arte. The Russian petagh is purer than the Ger-man variety, which is saled from the earth, and, before the war, was success-

fally sold in Generaly in evaporation with the local ptoduct, partly because of its better quality and partly because of its lower price.

Italian Ligatite Coking Process
A COMPUNG to UNagrate, an Italian
A syndicate has been formed to exploit insistricity a new ligatic carbonisation process recently invested by Parfessor Mondella. Tale process, the funtrans minutes. This process, the Ha-documental principle of which is the op-plication of superheated steems, is self-te give an excellent color, free from subfor and phosphorous, clean, hard, and of a calorific value of \$500 B. T. U. The pield of color is 45 per cent, and excel

heat stelles of appropriate and her are also Paris Green Used Against Mosquitoes

Mescalites

Till Colord Notes Department of

A activitize has made a report on
the use of paths green against the recquite peal. The paths green has been
dusted on awarage land by simplanes,
the experiment better reads in Legislane,
in this construct the contraction of the paths. In this experiment the parts green was situated with must due to some shallar

Gelatine as a Digestive Agent for Milk A SHORT note to Chemiter Zelbang A MG, numbers 5 and 0 seems com-positive has been advocated as a digrethe agent or recently for rails. The sails to which approximately I per rem of grinibe has been added does no contribute or only with considerable did Seeky. Noch milk is perikularly not ful to the natelion of children

Silver and Gold Foil by Electrolytic Method THE manufacture of silver and gold for an electricistic portland to described in Chronier Actions. The first step in this process conclude in giving a place plate or a cylinder made from highly petieled abrefour: a centing with a cele-tion of guita-percia. When this files in thoroughly dry, a small grount of cop-ner resolve is bruded over it and then a this fits of silver may be electrolytically described on the sense. The silver rally deposited on the sense. The silver adheres tightly to the underlayer of cop-per. The silver layer is then highly pol-labed and a conting of gold in formed thereon. In order to reserve the cont-lage that are formed in this manner, it is only measury to dip the sectal objects a select which has the noner of the mining gutte-persist or rabbet. According to this process it is possible to of tain contings and filter of gold on metal-ile objects, today only 0,000 to 0,000 gram of gold per 140 square tellilateters

Sugar from Corn Starch HE Bureau of Chemistry of the De partment of Agriculture reports exper can now be usefor experiently from even starch. It is religanted that one even exp will supply the United States with super in sufficient quantities to precial the needs for twenty years.
The country's enreal consumsion of augur is short five willien tens for all perposes, about half of which is beported. According to the possible to stop this importation,

Atmospheric Heat as a Source of Power

A Suggestion of a Means by Which This Reservoir Might Ultimately be Tapped By Haviland Hull Platt

rat materials. One of these is given or a similar vitre-OMIC energy is the please of the laster No prophetic back or lecture is complete on substance having a comparatively low melting point. The second must be a hard material, such pulverizable, having a higher melting point than the without executation on the provincity of treatment is necessarily under the province of energy notated in the stone of all matter. The glass. Furthermore, when in a five powder it recal be capable of a very inthusic solutions with mobies taggiforeer of this presidiffy seems to ed, for our thing, in convenience much more on mericans to be at a bigh branchistry relative to Exery ten-See cale of the continue more

energy by virtue of its over temperature to believed by the conduction of a of the lest cusi One class of abstractions revolting from nefection nation in guess is diffusion.
A single experiment of this kind is ininstrated. Fig. It is a service through a closed vessel table in distinct in the width law or addressing this persionary This membrane is note of a local of

retained that his the peculiar property of allowing nitrogen to past through it My atthough it is almost completely embers to covers. We now the the right-hand inspersions to cavers. opportunit with pure tilrogen and the left-hand cartered with pure organs, both at attampherio ware, the whole summates being at the If the resed is terrally second, as on the rist of a balance incordiately begin to move in the direction of the arrors. Practically all the

excess resircoles that strike the men

reheard from it, their direction of motion being on the sweaps, completely revened of the hitrogra teriecties, however, reas through the mentioner, and their direction of metion is obviously not reversed by luxuet with the membrane. The presents on the water of the wood being the same eryshere, the unbalanced force on the named rate arrive to come the whole wasel. far we have been traversing well reading enough. But the nermodality of the sometrare seed in the experiment described above is completely resemble—altropes malecube out pass through it with own; facility from eliber side. Let us suppose that we have a partially irreversible personable mem-brate. This membrate allows the passage of both covers and alterees makes her in allows them to pass through more really in one direction than in the other. With each a touriste the redition of the experiment could be not merely by placing the term-brane in sir at ordinary temperature and Therefore the problem of constra

molecular engine readons itself into the problem of

naking a restraily invovedby personable resolvents.

By were of a long teathermatical treatment at Ring lish science has recently descentrated that a functiweed interted in a gas in pure equity pend trated by makerales approaching fro one and than from the other, provided the dispusions of the sensel are not greater than the mean free noth of the technike. The reset street in Pie. 7. for exceptle nill after your valor per second to une from A to B that in the opposite direction very this completely perfected and ential being will, therefor, he men permeable in one direction than in the other and when incorrect in air will be subjected to an antiniative prompt

Unfortunately the practical difficult ties in the way of making such a metebrane for contains the sile ten great became its thickness and the distri of its holes reast be to greater than the

mean free patter of the moderates with log D-that is, in the case of an at atamasharta a calery, sixed one one pullbath of an fact. (2000-lend can probably by relied up this an tisk. The real obstacle is the numbers of the baker The real observe is the parchite of the lates, optimizes to down diagrammatically in Fig. 6. The first description of several parchitecture will be estimated four of several parchitecture and produced beging. The parch is to be constructed of two differs will parameted on the error of a middle, 6, which is fined

gless, and it must be chemically literative with respect to some rought, such as hydroductic acid, which readily attacks glass. The method of procedure is to reduce the second material to a possion most of whose particles are less than one obsculibles to un lack in dispeter, to mix this percent throughly with a mass of molten glass, to allow the advisor to herder in a stiftebie melit, and to pulled

as possible. The policied ma-ture is pert arted at by, say, loderdisects and. The place is diserted let the dark particles needs. With a numer of selfable strength writing for the proper time so may expect the section to avenue a surface outfiguration sheller to that above in Fig. 4. But mirror restories should not us a nearly

> broad the rence of a negarital microgram ting may be used in the development of each a process. process. Luckily, lecture the mean free path of a out literapes as the present decreases and verse there are other pure with considably legger rathe than these of corone and

nireges, an experimentally operative men-icute is more casily trade. Thus believe at the readly realizable pressure of one ten-throworks of a pend per square inch has next free park of mostly half an inch. It is a simple matter to make a metal sheet with holes small except to be up incide a laboratory newel contracted to a scuss pump, and it is probable

distant will seen by an accessibled fact. From this legits ning we can expect the technito be worked our for higher and ligher presures, with atmophotic greditions as the fast grad.

stry that this goal will be marked, how will such a surelespe be used and what will be the conse conces of that me? A short of gold me une-militarily of an inch in thickness to so fitter that evintoring would be the first requirement for its use as a mean of propulsies. A fine-would with arrest would not the purpose, the metal

> any director. Vales out constiting a membrane with mintumbe areas. could be needs in conveniest sizes and merabled in betteries. For most parposes these would be an cased in cylindrical shalls, rotability miscoled. A section through first it cylindrical bettery of membranes in steam in Fig. 5. The membranes are

ere tending to displace the entire of The design of a molecular engine exercise

to the shaft. R. The whole totor is a A, which has an extenset passage, E, and an third one end near the shall. The four waxes, F, mouth on the spider, serve the purpose of a first to keep the air in the casing moving with the rotor. Simple mecha-ical devices for turning the cylinders to say desir withma are provided. In starting the engine full power operation the critising to magne any ow-full power operation the critisiers are turned so that the force of each is exceed in the direction indicated by the arrows. The six in the casing will move with by the arrows. The six in the coding will meet the rows and the centrifugal force will maintain thatal flow of air through the coding. When the di-

speed has been attained the acceleration in observations from turning the critisers to publishe in a the line of pressure is diagonal instead the line or pressure is disputal summary or purpositivitar to the desired direction of motion, the offsetive torque being thereby reduced. To stop the engine two of the units are runned to oppose the other two notationally. To reverse, all the cylinde are murely reversed from their origin

A membrane having a dagree of irreversitality of one in ten thousand could be used in making an entirely practicable engine. In fact, so closely could these larges be period that an engine of 50 locospower could enaity be put into a space three feet square, although the first cost would peak the blab on several of the great area of published mercial, about one thousand square feet. The cost would needed, about one thousand square feet. The cost would

as would weigh only there or four serior Space is locking to detail any of the multitudio applications of such an engine, if it could be orde practice. One supposite is of so extrace nature, however, that it recet not be outlitted cylinders should provide a direct force considers excess of their own weight. They could the tion would result from merely turning them to et were of their ferre in that direction. alrebine with perfect control ought to be possible. Aft alighting, the operator could walk about with

ing the muchine from his person—the normal position of the cylinders would be set to pull appear test exough to relieve him of the e

Who Goes to College Nowadaya? IF you think that the butcher, the bake and the condisativinshine do not appre-ciate the value and importance of a college

education for their children, you at the registration recents of some state university and find out who goes to college now days. Revenly a survey was made of the eleven to sand students who attended the Enteredtr of 10h to determine the husbane occupations of the paramits of the students. Approximately 30 per cent of the students reported that their stations were farmers, while skilled and unskilled labor

fariners, while skilled and unskilled lab was represented by 1800 parents, of was tear than 180 were listed as "Subcreen." Furty-lever of the parents were necessary edition or publishers, 19 were batel an agent, while 18 were eccupying offices. Gallaction or preddenis of assembeture. corpution, ballo, academies and college Altogether business of some sort or oth claimed the attention of SITS of the paren

and 200 were specialising in scientify work. Two is dred and has were relieved men and 200 others w dred and not were realized men and 200 others were retired. Boste of the microthinaries occupations re-ourded in this need survey were; I artista, 36 tenderions, 46 and controls, 10 postmoniers, 2 theater minagers, 21 backwallin, 70 barbows, 28 chrosthours, 4 chesh, 4 lake orgonies, 50 miners, 37 politoces, 50 planebers, 2 heate porters, 4 pent denders, 50 countery wertens, 1 waster portent, 4 first content, to estating witnes, a water and 11 weighten. One student give his father's com-pution as "copitalite." These wave also on the list 160 clergrant. 200 decion, 11 policerons and not a single bergist. It seems pretty clear that the answer to the operation of the title is "everybody who thinks he as affined to."











Muscular Action in Work and Play

Some of the Factors Involved in the Simplest Series of Bodily Movements

By Guy Otis Brestster, M.D.



LAT bell! The pitcher is on the housed, hall in hand, wholing up for the first pitch of the game. All eyes are centreed upon him as he hark the ball toward the plan. What happens to his body? What What happens to his body? What happens to his body? What happens to his body? What hepers do not see some pitchers invincible, while others are barted from the game in

less than an inting?
At the girlent graups the half, he customets the flexes
massless of his foresers, which closes his hand upon the
ME are it is guided upwared by the delicted nucleic
Middle covers the point of the shoulder. The showledic forem between by the properties marse which
covers the typer part of his hack. The foresers had
deemed grown provided by the block contacts which has as in
flowers grown by the blocks contacts which has as in dearm appeared by the bloops muscle which lies on the first of this upper arm, unstead by the previouslie or breast imagels. The shoulder is noticed by the seventies regards or rib travelets, and the arm extended by the stroops muscles on the lack of the upper arm, with the thicking stroops destinated or the limitations and or language-low muscle functioned to the life, the rible, and supper term. The extensive muscle of the dream open stroops are the stroops and the stroops are the contractions of the stroops are the stroops and the stroops are the stroops and the stroops are the stroops are the stroops and the stroops are the st the hand and the ball is on its way. If a rurne ball is thereen, the hand is turned elightly up. down, in, or est, and the pressure on the ball regulated by the con-tion and Secor or grasping muscles at the moment the

New 160't this a complicated handle of nations for a sum to go through every time be buris a built toward the plate with the insection f getting it past the man with the bat?

And, as though the picture art was not d enough in the use of the prin cipal stucies named, we sum note that many smaller massive of the hand, area and body, are also called into use, with the further use of back and by number to thedy and give force to the three When these complex movements blend in perfect harmony, or stationical morement, we call the action one of perfect

coordination, and twine the layer wrest short the brow of him who presents it, for he is the instruction stirber the man who raries his openi, and curres with such control as to holle the opposite helps to hit the ball safely, if they hit it at all. alt the bell safely, if they lift it at all. The three mate pitcher pusses early to the shuners, for stall-may be effective at three his state-stimes over belonce his good traines and his team can never feel

ware of him. Can an incoordinate individual become coordinate? Yeal but that is another story. At prewait we are concerned with the neural action of the nea-Here we go! The plither passed the first uses up and he walled the first few stops secured first have, then trutted the remeinder of the distance. What lam-pers to its bulg at this time? Or, in other worth, what is the process of locumering?

what is the proves of investment?

When the was start existing toward for how, be Mine the was start existing toward for how, be considered as the control of the control o

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either folk or olog datring. Motors social standar, nather restricts from mostaler solike and deutsteen makin many incomfinate, held-rippled people to keep for the surpow In this firm of muscular action, the hip and but

monies are alterated; extracted and related will the ald of the abdunited and thick quarter. The level ign and feet are dragged errored to us add admixture of the incompliants actions to the add additions of the incompliants actions of incompliants actions of incompliants in the physician action resulting from this strange or strained are of both practice and incognising would make a book.

In supplier erect, we see the later massles of the lack, which are called the enviror rolant more The set of availabling is a westerful performa Etd and ever weeter what hatteried when two wis year food toward year stometh, or narred that it did not come out of your new learned of pring down to the neresuch? Or any yearself why it got in the windply-or three, and occardatally were lively to their how and must librargh the tree listened of going develo-in weakinging the dip of the tragge becomes dued against the frant leath or the rest of the invati. To reache on either ables of the result, reliad the Pillar of the Fances, contract and printe the broadle laward graphs the feed extends and turn-stag the powers by dresting the soft palate up and look and tight-site.

The tracks at the rost of the torgon called the adjust, drawn forward the book of the phortax of THE human body has been called the most reproduce machine in the words, on day not recommend on most necessary statches at the words, on the same person to accept it as just this. But have more of us in the registers in charge of the fact that each and every use of us in the registers in charge of the ord three upper-machines? We do samelting the well-reg or throwing a ball, which we regard as an extremely

simple action. In terms of the machine, however, it is enormously con-plicated, so that we night well woulder how we ever carry it to a successful insec. Dr. Bremster gives us some idea of the complications involved in every mucular action, and of the way in which the allustion is handled anasomically.—Tast: EDITOR. er part of threat, which shalls of the spare to be

hind the none. The epiglettis or tray there to the wind-one is closed by the lower threat accesses and the first has present out of the back of the worth to pushe toos the emphasms or stomach table which by provided action carries find and liquids down into the element. The outline process complete only about stochalf a se-col from month to stomach. Nearbor or other, we all get tengled up to the

breathing question. Our natural neaders; seems to be to draw air into the large and socil out the close The clief breathing into the in the closinger, which form the dividing wall between the close and shib-turn. In its natural position it is branced up in the solidie. Her the back of a seared rat, with the home position opered toward the load. When we becalle, we pro-It dearward enlarging the chest couler, which negative the air to enter the lungs and expend them in moved are with the increased quee in the clost cavity. In public down the displaying newdo, we peak out the ableson and lift up the ribs with the clost movies, from side and lack. In crassing the leasth, the disrages rises, the ribs fall, and the abdress is drawn. This increases intention artisp as well as emply-

Now, I wish I could fit my imp- with sie und be est a wild yell to startle yes little a state of attention, while I sell you way you yawa, which you may be daing by this time Textiles is one of the best unknowing Olings to de-

taking is see of the bot unitaristic things by so for receives, in the way of answerier action, and if often give thenks that no legal probbition or tax has been placed upon it, and that only she has of had named has from the inhibited this valuable shift to passives has first fix inhibited this volable old in health. When we pure, so till the arm, open the mouth and here, lift up the the, puch out the abbases, attends out the logs, and high about all the principal number of the logs this action. Why does this section is red to as signified, by are constront signs after the pap and stretch is completed? Try in time. Sirench

out word, hold it, and as you relex, storich your treat furfice and hold it open until you wisk up the nurvivos nistrature of pasting. When you fill the large with elz, you increase presure in the lates and shakesen and decrease presents in the cheel earlier which the large do not fit. This fartrand present in the ablence and decreased pre-sure in the clost cavity sanide of the lungs, hasten the floor of brough up the thorough fact into is way of the subvirties with and was cave.

Here, you say, wall is minuted. Who is this theories dust? I don't binner you for criting me to attention on this point. The thereofe dort, like the unknown learning who work you is not of cold when you are freeding in a fitned indeed, but of whom you know very little. It he the reversity of the lymphatic system and corries the discount fair and columbia hate building nunerials called hyspit to the heart. The addition of the hear's artist and terrouse blood circulation. will understand this etimulation to the circulation by beling that a lower removed from the body, long at haly temperature, and excelled with fresh blood and tymph, will keep heating for hours, and this with all nerve extraction to the brills and spinal cord sever Instead of going to the uni for wieders, watch rough not stretch and years, and go and do likewise. Perhaps It would not be a had blee to popularize the sweepth timing streets at leasted games with a hands up yo ning streets at leastern general water a negative to years.

Two, and entry the lides into workety useff the description custom of smothering years in

The new of the treatition nearly in spring, sustained action our new, 2 trust undergood to supply sir to the body ne part of the job, and to further situline the bestell rescited by increasing the blood and brook rireal-ties, they as offshing the chamin- narred level the neer of year numbers, without nemer

If there is anything in this woved watch faciles you to exercise action, you may return to the first part of the article and the view combination of burling mass to thewe it at the cut

Artificial Cell Culture and Cancer

By greening order emission the body for many years in School of Medicine Hospital, St. Louis, Mo., Dr. Mont new V. Hurrows to galatar new light on the caneer problem. His apparatus assists if possible to keep cells years. To: Sacross found that cells because from a substance which, if power in sufficient envents, will come then in grow or marrale. If the circulation is too caped this sabetance is recoved before the relia-ions undergone its effect, but if the circulation is should up, growth or adgraphic programirr a mill-corried arrest arts band and home be one the extractions of the much substract long recogn to cutter the namely to grow. It was further found that coul tar has the toantact cells away fines their normal blood sarety sufficiently to come them to grow and tentilely rell classes than formed enterpy and much are perregulate an economical a convenient mature, and can be tran-served into other unitsals for an indefette use

cubilist and current. By Digreets has desperated that if an extract of a concessor towards intented into which has its electrical impeded in a manner dealer to that of old upo a concer forces. Inspective over its represent work or more when their already strategic circulation is interfered with by mainted changes of self ago. Their exposed location endresses them to irritation and injury which inst be sufficient extensioning to come a registy sen Since this discovery that career may be not dated by the president of a defective recruity and of cells in the president of a defective retreatmen, it is possible that medical science will soon dard methods of posents that corners senter was seen for necessary of sevent

In the medical merid old ago is mored for its defection

By Professor Henry Norris Russell, Ph.D.

month is unicalitable the very favorable appointing of the phase Mars. Oppose as of Mure, in themselves, are estimate

the varie, in spite of the stern charge, the vacus, in space of the stem charge which she has to make, calcium up with her slower soving heather at intervals of a little sace that the years. Hat since the orbit of Mars in tely his math comes manner ourse on one side of the sun that on the other. The mover More is to the sun when we come in like with birs, the namer is will be to us, and the better we can see him On the present accorden things are about as financial as possible. Although the apposition cause on

234. a work befree prettellen, when Mars is \$2,000 miles farther from the was then on the latter date. the price proper you have been on the same one of the control of the cartile and price as \$4,000 miles farther from the son than we would be when in line with Mark periodics. This amounts to satisfang, compared with the planels distance of \$4,000,000 miles; yet it is interesting to know that we shall

he nearer the planet, on the night of the 20th than we have been or shall again be in the lifetime of most of our readers. Man branchers for singrestion at loan in this head-phere, is the fact that Mars in much farther meth than he would be If his opposition had over earlier. Though in 18 degrees south declination, by these fairly blats in our heavets, and is not placed, atthough seathern observers still have a netable adminings.

Being as near the earth, Mars naturally organia large and bright. of sangainade -27, which means that he looks nearly three ligner on bright as Sirtus, and twice as height as Japater No other claret over drives as beleficies. Vegus, who, however, suite Here free-field when she hancens to be at boot, us she is this mentils. With a telescope, Mars shows a cliek 25 tackes in Classifer-two-thirds or hig an Jugitar looks this mouth, and built agets on hig on Seriem. This is large to show pleasy of telescopic de Yet ofen we think that, even now

his best, More looks only us hig as n car-fret gitte held a trile away, we realize that we camput expert too much Dater the very best conditions, two Nack date 50 piles must up the obsert's warface could fast be need separately-it each of them was 30 or 40 miles in digm eter. Looking at the most under similar conditions, we could see the invest of the enters upon her surface, but might get split an insperfect tides of the meghanitopographs—cleogh the outlines of the light and their serve upon her face could be least out in considerator detail.
Our belief that Mark has a much

er surface than the mean depends, theoretice, not observative, as upon the recovers of brightness, which show that the pieces falls of much less in light, as the shops forurts from the full than the many does define ing of coarse, for clarafty (detaine); and hence that the number of stantons on the surface, too small to be sen individually with any relescape, must be much less

What We May Hope to Observe Much may be were learnered, each with a smallish becope. The plans i's wash pale to sipped well nessand

principle. The part is warn pair to tippes were remove un-solved. If degrees, who the Martinz making corre-agonds to late Normalies on the cards. This means agends to late Normaler on the carts. This means ageing in the sentents benophere, so that the polar all the sentents benophere, so that the polar this, and to match the charges in the larger duck markthe, got to water the energy in the larger dark mark-ings, to they not carried across the slick by the planeth relation, will be within the power of a readousle instru-tion, when the six is streety. The horizon must use be demonstrated, however, if the way this at thes, the the datable on Mure are not leard black-and-orbite that those on the raws, but half-news; and the fall ones are much less complicates in point of fart than it is necessary for the shorter to represent these on the drawings.

Professional extragoners, of occurs, will but neglect the taxonal opportunity. Expert shoot observations will dephilis be made in observations, as at taxon part requestions. But more attention will probably be given than over before to investigations of other mosts. Phytography-sirvedy brought to retographic perfection at organic covered or engal of returning persons at the Louell Obertalory—will give a personal record of the markings (effect, of regree, the finest details); and there is resert to hope that Mr. Silpher's recent success in pickugraphing a white area on the series which discovered in a few days, and seems almost

certainly to have been cloud or fig. will be displicated.

Misseures of the best radiated by the planet are
planed, both at the Lowell Observators and at Mount With the large (list new presented, it should b possible to get much new information, not receip along perstage of the planet or a whole, but reg the difference between the equatrolal and the pole

At 11 o'clock; Aug. 1. An 10's o'clock; Aug. 14. An 10 c'clock; Aug. 21.

The hours given age in Nanderd Tiers. When local sensors than in its of many law heart had been bill object on Assess 1, the NIGHT SKY: AUGUST AND SEPTEMBER

the presence or absence of water-view and expent to the planc's stronghers will again be taken up. The best attack fallows the line derived independently in test active trained the time devices independently by Linvols, Campbell and Br. John, and designate spectry-grams taken, art at apposition, but seem time before or after, when the phase's change of distance from the centric softs the lines which nev by revokend in 100 ophers clear of these interfering lines which con-y ore produced in our cam . If the new rolling tainty or produced to our own if the new rail region at Property target out such a grating on the In yourse to long for, we may find ourselves near a wittien of this problem before post year.

Her we must turn from these things and take our mount view of the heavens. We shall find Mars, at our restructor hour, well so in the southeast, and so bright restructly loans, well up in the stations, and so bright thin the destinates all that part of the sky, and quite stationers oil the state of Apparlax, among which is it merican. Joylen, though not a betilized, it sittent at destinate to the sentimenters sky, though nester the bettern. How they are set Apparla so that the contribution stars of Secrept. To the last cross Santonians, when Deployment and the Sections Palls, with Parallitude.

Serpens the artifreet. Dram and Dres M the meribwest, Uras Misor in the neeth, and Po topels and Cephens in the northeast. Aries, An index and Persons, in the cast, bring us book to use

Mercury is an evening star this wonth, and thirty well placed, though senth of the gan. On the 18th, when at his greatest elements, he sets at 7:50 P. M., and should be easily see. Versus is a marriag star, rising about 2 A. M., and

Mary is in apportion on the 28d as already described and is visible all night leng.

Jupiter is in Beorgia, has not all 13 90 P. M. in the middle of the month-before midnight, though he is not yet in the is no fer south. before stidnight, though he is not yet in quadrature, because he is so for swell. Seturn is an evening ster in Virgo, sentiage of viol P. M. on the 18th. Evanus is in Flores, approaching oppo-sition, while Neptune is in conjunction with the son on the 18th, and is invisible. The muom is in her first quarter at H. P. M. on the Pth. thill at \$ P. M. on the The second is it her five question at 10 february and 10 february at 4 m. Mr. on the 20 h. On th

s 20th can be seen only in n Asia, heliand and Generalist. There is an accumbation of Mercury on the 2d, the planet disappearing behind the month's data Man, for releasers in Washington, at 5:19 F. M. (local line), and respecting at 5:15 F. M. (local line), and perspecting at 5:58. As it is besued day-light at these hours, the photoconton can be seen after with a telescope. It is not all the seen after with a telescope to the country of the country of

will be some distance south of the tr

IN a pure powered below the National Academ of Science, Drs. Heavy North Brand and Joi Quincy Sugrest discuss the methods available for as-menting the gas pressures pressiling at the sark on face. They last aight of these, and present new the total methods of the contract of the contract of the total processing of these, and present new the et Ines, and hencesties and chemibrier lines, and hatmation and chemical equil-ties wher attrosphere. All lines of eriforce ag-the conclusion that the total pressure of the spheric passes is less than Old terestrial that and that the average pressure in the reversity one pressure than 6,0001 attrosphere. It is quit-de chemisphere is supported by radiation y the chromosphere is supported by radiative pressure and that the pay pressure at its hose in or the cot 0.0000001 atmosphere. The whole amount of main above the photosphere is of the sorter Cottle gases po-square continuous, equivalent to a layer of cofficery of the first thirty of the control of the complex gaset majority of soulier conscionates. The complex gaset majority of soulier estimates apply to 4

Our Readers' Point of View

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The Latest in News Astronomy

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Psychic Research Without the Medium

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Recently Patented Inventions

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Wine Coverage of Councy, X J.
Wine Coverage of connecting insu-lated wave electronic initions the necessity for remaining the mandatons. Propert 1494205. J. A. Green, 12 Tiggers Ave., Forgames, Mo. J. A. Goost, E. Tigen Ave., Fragman, M. C. Carrier, M. C. Carrier, A. Carrier, C. Tigen Ave., Fragman, M. C. Carrier, A. Carrier, A. Carrier, A. Carrier, A. Carrier, C. Carri Schnick, c/o Dr. E. Warehauer, 191 nobles St., Berlin H. W. G., Germany.

WHAT IS UNPAIR COMPETITION? WHILE unfair competition in trade in generally segund within the law of trade-marks, the revenue in really true is but a part of the more competencies field of the inprinciples protecting desired integrity and preventing distinct trade convolution. As in matters of trade-marks the law of

REMERIE ROTANCE—For additional varieties and compressed to be closed at will should recibe to present during hosey face. J. R. Cotten, n/o Balance & Holann, 1119 Sanc St., Senta Berham,

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Some Service States and Service Pascess or Pascesso Sorve Record (in celluloid files, as for lastere most parter files, as that tellular pictures or in produced Parent 1802556. A. J. Ch. leg. 2502 N. Broad St., Philloleiphia, Pa. Merrors or Caserna - Which suform ing the expecting frames. Putret 1890000 C. Draile, the SZ, Mannagton, W. Va. Garner and Mitture of Magins Schizsyrtists by (assize — water numbers only maintains a constant range of tem-perature for the mold. Patent 149:178. Il. A. Sciewers, etc H. Ketterring, 609 Belten St. Heed, Chryland, Okes. Tota—Carticularly for meeting general Gassacs and Stream of Maxim Roas and General development of the cludes type in wheel General forms a single stay of main teas. Peters 1995th, 40 Billing, of superposed size, Prest 1995th, 41 Generals, Pa. Peters Good, Pa. Peters Good, Pa. Work, on Heavy Gradier, 2771 W. Peters Good, Pa. Pet non Ave., Providence, R. L. control Pres-Hantug a measure for otting all medature and presenting disc-of the stude pumps. Patent 1690612. Belter St. Hetel, Cleritate Inno.
CHARLES WHE STREETHING AND SPILE190 APPARATUS—by mone of which two
longitud of wire may be applied and main-

The first part of the control of the Arrestante Deroca Constituting a bear-g for the oil spring of as igniting device of adapted to display referribling matter-tance 1460022. G. C. Faller, 13 Green St., adapted, Ohio. MITTERS OF TAPPERS

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Heart and Participa Transcrip-will not become lover during the lot of the speci. Putent 1499000 PASS ASSAURA AND MARKETON MARKET PASSAURA AND ASSAURA l. Tuft, c/o Ver Herlington, Vt.

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PERSONAL SERVICE STATES AND ACCOUNTS AND Het is accommend to the the first the first the second of a first line bodget. Peters 1960. S. L. Burtmann, Hilleley, R. Singer. 4. Principles, 27, 27 Manager, 28, 27 Manager, 29, 27 to Macross -- For printing one-

The Stamp of Our Approval

Talking to Your Prospects!



HEN Dickens portrayed a character who tried to sell a cargo of red flannel shirts and brase warming pens to the Fiji Islanders the world laughed, because everyone understood a the foolish merchandising involved.

But the annule of modern meethandisting are speckled with ries of failures, because Dickens' story has gone unhaceded and whatts and menofacturers are giff towards in and take an annule and the second second of merchants and manufacturers are still trying to sell their products without giving due consideration to their markets.

Excellent goods, carefully thought out advertising plans, com- it negative stant sales managership can all be made to register failure, if the port, 2.1. potentialities of your market have not been probed.

The salesman who made only one sale in two years—he was sell-ing suspension bridges—was in far better shape than the manu-facturer who spent his hard earned dollars to advertise a product without checking up on his magicet's possibility.

The science of modern advertising can be resolved into an axiom -Tell your selling story to the man toke can buy your goods-for true salesmanship consists not in selling your products, but in greating a consumer's desire to own your product.

What is needed in advertising are more "centers of impact" and less scattering shots. Scattering shots waste ammunition deliars. Bunch your hits! Tell your story to the man who has the money and the disposition to buy-and keep on talling him. Of course there are not as many men who can buy as there are men who cannot buy, so not as many men who can buy as there are men who cannot buy, so be why waste sales argument? Far better to recite your sales story to be will a hundred thousand men who can buy than to spread advertising to before a million who may say "That's a pretty ad."

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Switter Statt-Briefler

Printed Nove you Locountries has Com--in the form of an attachment, for po-siting a relatively heavy indecesses to be small Pattert 1407648. O. A. Petrit, L. & N. Shom, New Orleans, La.

Raturnez Chronin in hed in prevented nests. Patent 1600s and P. O. Britmann feelingstor, Culff.



Industrial Load Carriers

A belt conveyor is only as good as its carrier rolls. The efficiency of carrier rolls depends upon; (1) how easily they run, (2) how economically they run. (3) the care and maintenance they require, (4) the extent of their life.

The frictional drug of plain bearing rolls is too well known to need comment. A sticking idler means a worn belt. Timken Bearing rollers run with unverying freedom and with a minimum of lubricating attention.

Timken-equipped idlers require only about one half the power necessary to operate plain bearing idlers. That, combined with the fact that a lighter belt may be used, brings an economy in first

cost as well as an operating economy. Timken Bearings have the especity to carry not only radial loads but the ever-present thrust loads as well. This feature of the Timken Bearing maker unnecessary troublesome, short-lived thrust washers. As a result, Timkenequipped conveyors out-last and outperform other types.

Moreover, conveyor manufacturers recognize that where there is motion. wear is bound to occur in time. In the Timken-equipped conveyor, wear does not necessitate bearing replacement as in other types. A speedy, easily made adjustment and Timken Bearings are as good as new. This are means much to those who know the expense of shut-downs and bearing

Specify Timken Tapered Roller Bear. ing carrier rolls for economy, serviceability and long-life.

The Timken Roller Bearing Company Industrial District CANTON, OHIO

TIMKEN Tapered ROLLER BEARINGS



The Scientific American Digest review of the technical and trade press, consi-

of these body materials, is being reduced to algebia a period comparable to an augine break- or the down tour by the utilization of the quarter lives take sourcery maps, which saids utilize appear taken rays. These maps, which said yest confronted the the upper and of the visible spectrum place the super-section of the state et a paint, me adhereit sout dans, while 'De striking the wave the subset of an irect important version and paint up a dang which there the name are periodic demonstrated and term is one in what to both the a set of term in a particular of the situation and a paint of the lawer paint were satisfying the situation of the lawer primarile of the situation of the lawer primarile of the contract of the situation of the contract of

same in comparise will filter offices and produce output analysis. The Aller-Developer of a smaller of the comparison of

wheter around garages does not do pool or the leased or dasper of polarities yet



The Spirit of Pioneering

med the early versions who tan ty of hone to test opportunity in an unknown la in the march westward that resulted in this sen And they have impired the se invention of the telephone.

The history of the Bell System records impatience was less than the best known way of doing a job. It is ady and continuous search to find an even better w telephone activity improvement h w methods of construction and operat

used capacity for service has been the result. accreased capacity for service has been the result. Instead of realization to the phones accreasing two recess in 1876, noday finds 15,000,000 telephones serving a whole people. Instead of speech through a partition, there is speech across a continued. Instead of a few subscribers with o regarded the telephone as as uncertaint try, a nation recognities it as a what force in the best-man of littles.

Thus has the Bell System set its own high standards of service. By to-day's striving it is still seeking to make possible the greater service of to-marrow.



AMERICAN TELEPHONE AND TELEGRAPH CO BELL SYSTEM





Complete as shown for \$262.00 South First Strain More Drive Bank Lath Units State of Strain State Completed Lath, Sect. Services May, Services Services

WORDER COLD PIPE, TURNS AND BAR SENDERS

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The West Point Military Academy

Our Democratic School of Arms, Whose Motto Is "Duty, Honor, Country" single represents, and other important for

linion, and or counting a load where the manufacture legin to cheer to upon the river, the transfer is spartied vides of a great rendered features which too him hark in threache to three tonjectic, and terraral survivale, also be frequently count for hills and from such the news of ski Energy Upon in oute he will been that these treened and further negated heliforage represent the latest addition to on the most -- perhaps the most -- farance military art the good - perhaps the most -sellitary and the weaks point of view the site is most admirable. The hutblings stand upon a tempte of relativishe. The intibilities which tipes a resume or plottess of loss, which lets out from the entriester cause of assentions, and they are destinated in the carboding-like Culetic Coupel, and by Fort Pultons of eletikanty dan, wideh sinneb apen the sees sound! of the recentals and looks down upon the reservation

time, paintens and theregites which has ever since been maintained. In this wise Congress super teen mannings, in the ware tempera-matherized the needing, there were but ten redete trainer trainer time; turber it carries a maximum of 1344 The sives of West Point and In written from Sen sket-the artification, the address, the edgethere, and has, and in our solting, and invertage of all—the ethics which is exceed up in the hapiting tools of the availage, "but, lines, Country." Of the unblighted feature it is for property, but have we cash jest store, to so, very much. The distingred pands great the teatly Setested bills, species to better view could be an-ested than the almage

system of discipline, the bragit of the comme; the the Blood-partiers Hullding, with its great Keeptester, 14 stories in height. Ender him the wardour neutrel that perstates for Mysiling the Library in say is tired; field, where the cases have their name. To the west of the Academy buildings are the two quadratation of the Academy in, containing 451 rooms. He is a poor Asserbras. destinate laded of both explorat and historical extenwho can unable around West Point and not be up-lifted by memories of Goats, Lee, Norman, Sherifan, Supreal Jurken, that abound within its buildings Turning to the numby collitary side of the Field course, we conset do better that quote Major General Fred W. Neighbon, appetitioned of the Argings, the brites in the Japanese Journal: "The milliony scalesy is now changed with producing radiance who are qualified to lead a picture.

represent the first and at the perfection of the cases buttaken as an inferior rife unit, now cover the master

the left, and twittled too of all the springs infantry weapons." This enterposess

of the addition tentains is obviously due to the regal able development is religion. material which tenk place during the war. All the casets are made facilities

with the construction and

defences and sey trained in

to impose who tay seen the

cadels on parade, in cares or engaged in drill with the

> Surrang Corp. a switten Persole ground and no

for free Tropin Point The Instruction program is very

commission, condeting in

that has been given during

the technical new of marks gars, title gars, and the

from an elegation of world The War of the Benthen left ledded in month constantiting, strategic vita affer and the close powels. tion with Groupe Worlden

ton, stands presumed. early progmised its sufficers value, and thei Amete nan contracted in 1777 on the extreme eastern tip of the Materia, and Feet Pattern the suggests of Mount for to block the passage of the british surships, the river of Schaffenest judat wearload The two interesting and patiental pole to be legal teday at West Point to o length of the chain, which feman part of my colored of Post, About this tree, in 1778, General West gard no special dress fate Cham-plain and Lake George, In endmove to 3-th lumbs with Sir Hears Clinton ending up from New York

ner half of the notice plant forms the Paperin Gressel, in the formational are digits the Storte Field of new Carry nets. All the top of the half is all Park Patenne, thank by Wankingston, Jackse now the reservoir of Carpet. To the half of the Jackse up the Administrations. Registry and part of American justifications in the corne gardencephe Stortedon. November they are now the North Remonds and the Operations in the record are the Editor Half, the others Novem Carbon. Removals May and the Officers behavior more free Our well-known military scadency at a glance: Airplane view of Wort Point

be was captured, and address to Chains's forces rege, be returned to New York and the offset to set up a directed that the fortifications and defenses of class sears, but in agite of the repeated effects of Backtorias to establish a religious academy it was or until the year PSC that Congress authorized the

It we wanted and famous is due to Mak Schools There who become seprelamental in 1902 Sabad the recognisation and sabilitud West Point as we dark of the callet in governed in the

that of the cited is governed to the cases therpress-tion of what it means to be at once "yet office and a gentleman". the giving of daily marks on our province-

of their value in storage on this way. Not will any one shoute the wholes and good note of the archi-teris, Cram, Goodine and Forgues, in selecting a modified form of Medical Golde for the extension a modified from of Section 1 to the efficiency building which became processy a few years ago to become the executions for body of coolers. Executately, or hullelings are of a character that learned the side of satisfuls the morphisms Codes' Planel of which a ciding mesters (legressum eprisoned the continuing offer, "Thurs! Who, sir, this is rollers ting effect. "Thepet" Win, six, this is be set. It's a fulf-bloom milled int." The Calent Chann In Definal is controlly bettle object and corrier a given

expection of the chapel of St. Deeper at Wisdom It is content above by its master plots speculing out the content late a state-scaled out; by its visit the regard testile flegs, elegants of more a bard fleaght "Sports of our military lister; sixting Hall, the skyling views from the story is the listing Hall, the largest in coloring. On the opposite side of the other this art the Aragest beliefing, and here she we find the Library, with menocials to Whiteler and Pie-former West Pointers, and other nonectals to many

of the north, distantished relition was

the preveding neadently year. Thus, for the first class there is industry evade. with remainds of trees bedity, signal resessor etilers, and so feetly Attacks are made as to warfary and include the ageting engagement, overse tion of position regulatories of position, etc. men of portion, organization or process, ee., it wasce service rife, marking gas, one-pounder, and field until-lery assumentials are used. In fact, the cudets are put through as near an approach to real war operations as

A besk could be written on West Polon's setticitie but within the everyow of this stiller we can do no name than give an outline sketch of the third works of our story; amoney, the course of analog of fact it is an inelligible of full college grade. A cade must be exceptione processed, and his assettal qualifies college, the overse is hard and calls for full perstal

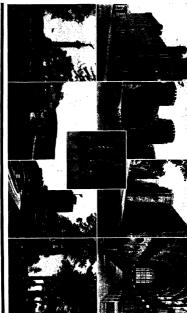
and physical effect on the part of the student. In his first year, for example, he is in the section many from that year, for extension to be in the section room from 20% A, M. to 200 A, M. in the gentations from 9.20 A, M. to 10°00 A, M., as study in the harmeter break from 30°10 A, M. math 20° room; at study signif from 2.P. N. math 8.P. M.; at delli from 30% P, M. until 4.50 P, M., except Wetterschap, and Security, M. has then to lithout for revention and exercise from (Cleaning of more 220)



LOGIN VARIAN A OLEKCERE IN LIEE AVERING. V. ERM.

A STATE CAN'S CONTROL OF THE STATE OF THE ST

reside town and the adapted price of the common of the com



Tabbing the How Powder Pressures and

By Capt. Edward

detacted that pulling the tragger usied firmus treats in a first infer-ulty, whart majors in pressure from richt the count negative per wetter (Selt. de My-the three-aid profile ness regard of the shotgan, and the noffmax rifle. The lengths and instrument 22 rather sens, highests to be sometral of invited the level firm witide He berret chander, develops out services made process from the terthrough to fearteen there and remote per

square lack, which rawho that it con-mences at a figure often the shalpen leaves off if the welfare of the shalpen sper is at all considered. tolores and plot is ten through provi the same guant of pressure as does the little 22, the loss figure of present sixteen thereard mends being rather higher than the top bears for the ZL stock would be It is this fact that a major cartridge may deside an extracti attenue on the chapter mile and brook mechanism

that is responsible for the disappearing actinute end-ires for tes philab and revolues which are oved from Naits, Portugal, Germann, Belgium, Mada Timbactee and way visitions, to be advertised and dispersed to interpretable exchange "Inquesters to thee atlatened and parations become sought the advertisements. A count of the advertisements in the developed 16 selectionsents of these charge plots and revolves, and in right different "Insacting contention with nature in interest improviouses to the real imlitagested phonds and recovers are used into an danger can but it is to allege with considerable combacts that In per rout of the different

the districtive processes that might easily develop in the classifier of a firence, and because termential companies which detailed uniformity and load and source of realt, the fixed of education apparatus in seed by our pursules and removabilies aged

Probably the local selentific is the groundstate for taking charder provides, which provide that provide by the shaple method of remembring the arrowed a request red is compressed, but which unfifteenable, comes not to stighting as to the speed of which this work is det memourh to the life of a charge of number in the breed of a gas is to work at passing the hull what charge down the laste, the method of surfaint has sear bearing. The copper creeded in the

provincing the month water that is management of 30,000 person or as extend in the chamber but does not up whether it happened gradually or like a blow-one explored or a delegation. Her was such a heavy exhiging door he is park or eat pet the same energy late a blow, lest spenies of the door, in the other a curried repel and a lettered the

In spile of this imperfect method, notice the bullete gatheren fint or her hids the presente is remain; or the character of a gain for bering a lode through the heaved stell not right angies in its laws, and at the order of higher accessors or not far free the shoulder of a bettle neek contrider. In the bottom of this, about 1/20 litel in distante, in project an open this is itserted a little water of shad red closely tilting the hole, and called the photon. Above this, is the "studyet," up. pourse. Above this is the "remaine," at without alread services of trial less quarte of CHASET. A threat block held in a become firms ford to the barry, in wround

Speeding Bullet



Wire the gas is fired the gas bloom out the little of coper and between places and throse block such as the length of the conduct named before before the risk the species of expendes and us the force pressure in shoring ; determined in artest test in a murbine for each let of resires, its charge in inight as stone in a pair of information is and it commented byte tearth me action lack he extremes to a table. To drifting a number of

pressure within the length of the lart, nextly pintted from the figures so estrained Hotpet treiting rangines, as a role, the tree of a lead rapher instead of the copper, the pressure of from three to five letty fore not being entheless to make tree! chappy to a couper crucium. Less serveure contrider three intended for the in pleton, are totally core, of crope, capitally property

The lotted do not please our ope orders of measuring the internal large serves taking the sequence of high convenients of the conf. on the "Woolwich" or eliminary strengs. With this

Velocities of Flight Are Measured the copper crusher is breeched up directly in your o the carridge case, and the herrol is not drilled a attermine sitered. The herrol is several late a givet steet bracks, arranged so the breech of the barre

may be closed by a circular wedge system with a any to count by a circular weep system with a plug screening up and leading the assembly. The countridge is dipped up to the neck in a light off so educator friction agains the scalls of the closuler, and is that in ecrted into the chamber. Buck of it i placed a bullow places und in rear or the court cruster, a thick can disk with hole through it to remait of the passage of the firing pin. With the wind assentity firsts beenful up, the first pin is released and norse forward through the perfected crasher and pisthrough the perforated cracker and pla-tics, and first the contribute. The case morest back under the gas threat and compresses the copper cracker through the agency of the platen in your of the

The adventions obligated for this type of presence encurates in that he means a regions business rarged up to fit the timested parties of the barrel peoply and nariety of rife carifules may be bested in this marking without de-troying the merkiness of

drilling through it for a side-place is nise alleged that the raw, anning regressed, give a correct picture of what he transpiring wit chander than the side places evaluate in which the figures obtained, and where the gas threat is taken right engine to the normal successed of the wave-Taking the conserve of a cartains has necessarilland simple perhapical operation economic with the ext injerveding expedien as to boty fast the built or sha charge any le travillag. Very ourly experimenters track in the days of black resolutions and absentage soberical projection, found that pritter Grandfuther's lader plant the hornel the prevenues part he taken other watch not yet the much mate reduct stor-matel doubles, we have done and to a case of the insperiod much information along three lines imparted into internation using note that for many as applied could be, over short impart at least, the inteste traveled like the charge of whit frost the colored period's gen, of which be alleged 'to senter did it short than it was there.'

The apparetus fittells encoved has been in use for a half explore, and busyed only in detail, not be original scheme. This, the Benkings, improved by Chicago Hondon of the British Army, measures the tioner street of the lifting Arey, measure for time required for the belief to travel over a given distance, when the feet in American secretics, by the full of a loavy weight, released at the time the hulle leases the number of the gan. As the time trans for weight to full a certain distance is easily table form, the leater there is read directly from the table showing distance failers in terms of time,

the shoring distance follow in terms of time.

The markine, known or a ricrostograph, makes the of two beary rods, tipped with iron, and held suspended by two electromagnets. It is probably not proviously to resided the reader that when the extremi passing through an electromagnet is interrupted, the magner reases to be of any attraction to steel or iron.

The first or chrypenseter risk is usually Engineed by a stor or loaden steery, and is held by an electromagnet connected with a wire stretched across an insulated frame at the named of the gen. The great or registers red is held by a map net composed with a network of wire or a steel plate engily moved to break the current, and located at the further and for measuring range. Below this red to the irigger of a speing-inspelled kattle which if released, sorting out and strikes the chromosomer rul, heaging rises to it. When the registror rul falls, it relegathis knife and it springs visiontly forward.
When the pun is fired, the build they are the circuit of the images the sides and the circuit of the images helding the chroneceder red, and it principle consenses to full. When the

or so of the range, it encounters the s



o take breach po where is not up for Determining the powder pressure inside the gu



which the bullet largest breaks the moreting effect by moving back the love, shot plate.

Some details of the chosengraph notifies that take the time of the opending bullet.

pines or with network of the circuit controlling, the second of motions on, which happy released, the fulllar fields, adding the release of the lattic which is larger to the controlling of the controlling of the acceptance of the controlling of the controlling of entwo of the circuit controlling of the controlling of the acceptance of the controlling of the controlling of the acceptance of the controlling of the controlling of the partial set for the controlling of the controlling of the acceptance of the controlling of the controlling of the acceptance of the controlling of the controlling of the partial controlling of the partial controlling of the controlling of th

The did from of clinesceptish such use of a periodic of the clinic clini

and the registeriors are in the development of the demonstration wilds, involved able from the control of the ballet in travel the range hearth, which way be 100 to 200 deep, depending on the type of assumention before level. This is couly convered that day per sevent. Which he are sharing, the average whethy, see the distance being taken as the orbital releving at his distance, being taken as the orbital releving at his frame,. The print anseath wheely is collection and depends on the brillief; reveloper of the buffer and feepads on the brillief; reveloper of the buffer and

to the size of the

police, it would be obtained; publishing to permit the budge pitch of the charge in brook the endotions directly and the facilities of the range. The chreatlessmalling plans, therefore, he smallly stop up with enough spitce resistance to require the largest of bleet 20 per ent of the charges to affect in leview work and hereal the registers edecall. Assertions facilities, storyly consign, take their shift windows of the charge of 200 between 1 perfect which is looper than the sectory, range of the bud close to the

American Section, growing consult. Man their shift American Sections, growing count, blue their shift whichly over a wrapp of 200 Sect-40 prefer which he should be should be set to be should be should be shifted, and markly as long as the swrapp roung of the widefunt actually ailled by one guarant. It is, of crurs, net at all as long as the mage should be passure when he have recounts the title of the Milling of the should be violation.

This would be about equivalent to taking the todeout, or of our file beliefs for following more, at about 150 paties. Settler the obstant figure, for the finance than obtained in the finance from the other bases of the first first first bases of the first point of the first point in the first point of the first point of the first point of the first point for operation first for first first point for operation first first point for operation first first point for first point for first point first first first point first first

receives. The former of St. 6 and probable the most common of the discs, which have the remarks with a regard of EEP for per second, notices at the Depart most misses Josh and of the registrate speed, with all the depart distances has but of per cent of the original speed. At 60 gards, the cond-be limit of pre-state speed, at 60 gards, the cond-be limit of pre-state at the proper at such as but the property of the speed at a sufficient to both the property of the speed at a sufficient to both the part.

The botherd is made else that comme above the terms of the statement of the terms o

another how may be recorded. 200 in the ferroise criter is about 1000 best.

The fulfills have taken whethy never 200 weeks habout the contract of the contract of the contract of the fulfill and the contract of the contract of the extinitional persons who makes the left to before that fulfills assumation was much hence them contract of the higher speed.

plur size recompage, as with the provincing paper of plur size in the final distribution of the sixe policie. In a gar deriver as to the acqual posterance of the observe in flight. "Nitrigita," or the forpitic about of faster politics will the lagging of others, is alonn only



ing a sheigen pattern made at forty ye indicate the dispersors

In special oparation, such as resoluting disks which higher difference in time of arctiral to different spots as the disk on the the foliation for the according to the of which there is but one operation to be found in this results. In this expansion the face of the marking is covered

The difference of the pre-claim and the difference of the differen

metables and then the pure content further makes. The term of the full fill and the pure content further makes the full and the full fill and the pure content states and the full fill and the

differences for the various police. This is the only absent device for girling individual policy whereing for the various portions of the charge-ing, bettern, and center, dillicage, of centre, and revers, policy of the charge, which which range from 10 to 200 in number.

Our own utility werely were at those an largeouse of the control of the charge.

age of cinemptals known as the Merdeen from the product grounds developing the Lettersteel. Here the mending perilise consists of a resoluting sometime and kild speed to an electric motor. Whils the later problems of the pain is a strip of securitied paper, and the production of the security of the production can use out and only to the contracting man, for special on the estuards different clearly, one of their parallel frought the whole of the manner of the gaz, the eleclating beared at the furnities of the gaz, the eleclating beared at the furnities of the classical parallel of the contraction of the contraction of the consecuency.

some set select reterm the interfer of the state, as the other is easily state of the interfer of the interfer is easily state of the interfer of the size reaching forms or pair. When the battle selecstate mealers quark loops from the second terrands interfer squark loops from the second terrands internal that grapes. As the straw resolves at a kasant interfer loops as the battle threads shown the insected the time lapse as the battle transle shown the insected finance.

The Spellbinding Kilowatt

Microphones. Amplifiers and Loud-Speakers which Enable the Human Voice to Reach Vast Multitudes



er of twenty-four had-speaker horse over the et's plot form at Med has been developed the public soldnessing Whereon that we long ago the verter had to exert himself to the ground

men in a large matabattan. without raising his sole

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anywhere rise. Indeed, the Tork, mexicon in a large

will be beard in the subliparks, in Washington, or Books, in Charge - sur miners, in Chicago - sain where, in fact, if what be-ings to very let of well-best

Importance. All of Alark

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his roky much one or two

the modifier produce applications, baker stocknooling would the openior waters the Justifux medie on stant's and when it threatens to go beyond a certain visite for reference the consideration arrestingly. By Tends of the speakers' sidily to shoot, and began how lead it Is said

High over the platferns long a group of horne-ic in Christani, 24 in New York—insiding much like the transports which one exposed to be part of the to the smallfulty expension. Installing and teeths the equipment, which was dute by regiment of the Western Dectric Chappan, was no mean job; several thousand feet of wire had to be run, such of it is firstly contain. To serve the proper release of scattle the analysis, with field trieplens arts over which they could talk to the next at the centrals. All the agen tetes was distincted, so that a fatiger up where well interrest the wroke only to lead up it book to these

The conferent mad untidde for the levels of the posed public has even user destinate to a state of soften in the New York district above were for the tracks on table were present radio with and for applifers. These tracks master in Windows toke medifera Herter engineer, were et up in 175; Hell Park, Nadangten Sprace, and Nadron Sprace, New York, and its Johns 175; New Johns Strater Inch was

of President Coulding, M. Cicareccus, Jack Designey, Suprier V. Bele, Governor Helds, Mayor Carbey of Boston, and other regulates. It is expected that all the The strain of speaking day offer day to over see audience, rouge there constitues, has control "stanging" in som of rigorous large, and has degrived the electronic of the hearing and noting many of the maddate. With the smaller of the tracks, a gustier using only a renovembered tone can be least easily to 8000 people, and with the larger one by over 00,000 There are audiences worth another's while to oddress repectally when they can hear well enough to fir

strentistly to a worthwhile pressage.

Another isologically development of the past will be useful to conflicted who travel in private Phil-This everyelees mirrophotous in special between ings on the corr platform, a fear-stage amplifer babble and compact bette festitied to the car had continuents her enquer excited its next to affiltee remin at mileted stations settled fines a day with her little officer

Wildle londoneuker design has so far limited (twelf to medicate theory, on several occupions long themselves have been covered. In one of the early tests, sende have projected ever un intervening valley to observer.

The subset value. Transfers leading New York for Europe are frequently surprised, as their strange names down the Hatlem to hear the of their translet being "reged" from a tall building on the water front This is the init of the beast, so to stock, and engineer

of the Western Electric secusionally use it to led their friends good-bye in stem torian tones. The seaso terior tones. The was of the certific in the big forwill be used to address mass meetings of excises both indeed and our The lest known type of

public-soldren entipuers is available in three dif-ferent sizes. The largest site employs four stapes of stapilifeation and gives an energy-point of 10000,000 projectors. This is said able for the largest public mediteriors, and entherines. It is n terms nest part of early places at Civic Audherine, Ser

Francisco, the Auditorium Chestand, the Manicipal Plet, Chicago, the Ivid-sens, Los Angeles, The would she has also from stages of amplification, and is salished for reco-mute 3,200,000 calcivity. Asiar, Commodore and Wattherfolderto Betels,

(Continued so year 225

speakers for the facilities Various sizes of ind rpe loud-speaker, ranging from the smallest for hom-tor authories, in the laboratory of Dr. C. W. Howlett Betroere both the Beneddless and h tay gapeneave and Decorate National Conventions, consume was

frequently made on the careful alterators paid to the approxy and the lack of "billing around" in the lat-center during species. The travel, not alteraomes carried agreement the traces, he are no operation, each in the farthest state, reads here related. The great humans ment over former conventions was due to the system of toon smalltone statelles for the two states. An exactly bacteries fratter was the large and only christs existence the Heister Intentile to the head enviling of the morney to the lift war picked up from the us and per our through portable steplifting ourfit-For leth of the convertient the anneithing entire tunes note the relater, state-of in the circular hearthe which has been no familiar in niches of radie

uniate. There have connected over independent elevative be the couplifying apparelling bedded the worker latter comprised a terretage unusup-tube amplifier, will be become posts -took and control validae. Seways takes committed in prologost, and supplied with direct reports of MR tails. As horosotte adheses and one of great importance to the audience in the indicates, a design empholing a wingle material take and a physicister whose swings indicate the volume or

und in Circlesia. weaking, these irrarks carried a toll-board large stand for a speaker's platform and a fidding and with a

seried a free-Wage vaccine-into smaller, and do large: while the other tracks had there-stage staplifers feeling four botts. Storage letteries formished both fintest salpius carrest Micho pires of the pintform or exected to be made, led they best delete. Her of these cettles was bussed to this set II R. Green, who will see it in end along New will see it in end along New thefired this sensure to be with their leadants prospnet from My sem whither

HAP. These trucks and others in Western Mericle Seel the altered played to keep underson all overthooseners then has gireal legal ner-than \$100 miles and her simplified the voices



one use to the large one for

Our Point of View

Round the World Flight

hence to the Army pilets who, at the present writing, have covered over two think of their first angual the world with a starrow which he stready recobileted this of response to marking an eyech in the bloom of Rum though your hange of the North trip (a certificatory which we do not fear), comptihas been done to recedifule this fight the greatest of all serial accomplishments. It should be county topic-wood that the renture was

no mere, damedrall, special-spin "stare". On the contrary it was quiertaken in a new seriese spirit und for a details and highly landable purpose. This is shows he the brief official appropriates ande to the War Department, In which the purpose of the flight was described on follows: "To denou-train the fresh-Miley with which serial communication may be established lished between the various neithers; and to elouin desired information convening the operation of present type already in various distance of the world.

Only the most raphlete critic would done that these two maker objects have already been necessabled. Three places have consect from America to Asia sa centuity, and this in refer of a succession of wind, sleet and encounteries of great intensity. It is this feet which gives exaftirace that our filters will crossthe Atlantic from mad to word, on surely on the British made the restrict stronge a few fears ago. As to the elitativ conditions, they needs not have been must varied, renging from the cold and dump of the Alaskun The objects of the expedition, we orwal, here already

Finally, we must not forget that the sucress of the flight is a great tribute to the exclurance and technical skill of the greet pilots, and to the neighbillry of that remarkable product of the war-the Liberty motor. Ner strictly we seek to resulting the great advance that has been made in perial marketies. The certainty with which the pilots made their way from point to notes, ments volumes for the notes, conceases and various service ship to morigation which have been developed during the past few years.

It would be look ungenerous and union to deprodute this great perfermance by pointing to the costs and alaborate manufactive that amoughed the over at the rations intellig player. This was played work. When the overcontel attention for which the Army has then pared the way is exultibled, the aviator will be assisted by even letter feelilities fixed times which were

The Super-Airship 18 will appreciate that, unlike the almiane the airship gains cristively in sectal had as its size facewees, and ferrin lies the great preside for the fiture. The fitured for processes in the "Netantideli" lie impost right sireble in arthy speculies. Before here in the WEB IT' was shall become able will become with a exparity of 2.02.000 million cable fort of gas. And gove comes the definite numeroconsent that the Definiperfected in healty the solutance of its investry to a private receptor, which he to highly two ships for service to India, on h of which is to be over double the

also of the "TDA" and have a managery of Suppose At the last mostler in Leteka of the Indication of Neval Architects, Communics C. D. Burney, in the Naval Architects, Communicative 11, 11 paintry, in the course of a paper on "The Development of the Abobia with Navial Reference to Truty-port," from worse Unreferring facts regarding the experimental work in the laboratory and slope and its results as applied to the designs of these longs slope. Potedy stated, the utital engineers are adopting in system for containing the me but, whereby no frameworse hard is beganed on

the localizations at others, and the lift of the gas but ted and transferred to the improver frames direct" The importance of this is understood when we remember that the weaker element in the right already to the hearth officer of on it is exhibited to empression. For it must be recombered that the extr provider stress in increased by the fact that the gas beg sidewide magnitude. The faiture of "\$18" or Rail. Englaced, was due to the conditioning of time two street, together with that imposed upon the girden by a spilies throwing over of the beint when the Alb Was retteling at high speed. If the Sisting engineer have surroused in theresting the lift of the gas bugs directly on the rirector frames, which are well able to into cure of 2, they have made a big stee forward in the development of the art. Inked, Commander Purply tells to that It is now possible to construct a remarcial electio to which the factor of safety under

the worst possible leading conditions will not drug

letor a pininger value of feer, and that this can be done without uny addition of worlds. Partierners, improvements in stream-line form Objected the Directed dynamic stores and make it pendide for these hig ships to uttain high speeds with slout II per cent of the lacospower which would have been required three years up. Also, recluding that the warries of helican would necessitate the use of hydrogra, attention was directed to the resonal of the risk free gentler, which is recognized as a greater search of damper them the Springers. Designs have detel oped by which a beauty oil such as kerusene with a high than rates may be used on a languagementer ride Milest loss of efficiency. Commenter Darne rely to that they have an englar which weighs alon is per todirated become ower, and in one in its medicaled simplicity and reliability with the sories steam engine of today. Experimental work in bring done with a view to taking will bearier olds and so the create oil for oli-fre-barners, and so well excluded

is be with the result that he ented his address with the statement that he could comblemly say that the confine our for the simila in contraint, and indeed be used without expension. These expendicables will excite interest if only for their great dissentance and the new atmentant apstanted : hat of greater interest will be the new heart or workbeartr of englace Miles will defer these

Rejuvenating the American Locomotive IE distinction was by the Assertion military to due primarily to its substrable fireignic services, Which is verticely instituted and distinction. In this field, but no regards the size and power of the kermetten, the length and wright of the trains, and the less rate at which freight is haded they as outpured with other experies) American rationals stand in a clear by themselves Hitherts, our efforts have been devoted so closely to investig the power of our investions that we low rather crecipated the question of their soon with the most that the numbers of these of the fact has been loss and expansive rated at between the nul six on our. In other words, the locateding has ters coulded an extravagust coal burner. But, while this was true from 15 to 20 years ago, for the untitue devotes there has been an investing efferis improve the threstal efficiency of the brewatter. It will be new to many of our readers when we state that whereas the maximum thermal editioner of & powerful in-custre on the Pennetrusia Railrend in 1964 was 5 13, as 1925 it had rive to N I. These factor ore given at this year's untital meeting of the Am ion Striver Association in a proof in Mr. W. B. Winterswil of the Line Lorenstive Works, in which he alowed that the great favoure to recent years in

the wright and country of our laconotine has be meriod by a decrease in weight per indicated herpower. Increase in size and the development of

Down through the years we have lifestrated the rarious references looking to more efficient operation which have been tried out both here and abroad, the nest rever and striking of which is the building of turbine locomothes. At least for the largest income tires, the furbine is not attractive to locomotive hall-key to tide country, the great difficulty being the problem of contenting the large volumes of slean which have to be handled in locerative whose total honopower runs up to several thicsauds. Furthermore, let it not be forgotten that the maximum offcleary of the turbine is limited to a comparatively specificactors of its speed, and that the problem of process ing has not to be solved

Hitherto, our effects to this eventry have been cutfined to the extensive use of high-pressure steam in colladers. We have tried out the two-collader, the three-value, and the four-calleder regressed, and teday there are 660 locometives of a special type in service, complete 250 pounds of aleson pressure, which have shown high efficiency. Their coal cates have been less that two pecade of dry roal per indicated horse nower per hour, and the relationsy rate shrateed was less than 1.75 records. This is us good, if not better than the rate in the overage store plant of the The elimination of back pressure by coa density has been widely studied in this country, but, my may be not unuted the personal amortical polarior has here developed. Signal results use below obtained by using three criticisms to increase the caracter and efficiency of housestiers. The uniform turning torque noises for incremed tractive effect, and the incremed number of exhausts in the critisies, by producing a more uniform mocke but various, results in improved conduction conditions

Enrich Channel Tunnel Vesced HE PANAMA Canal, whose first ten years of

for alread in pasers), has now virtually passed and section was calchrossed last mouth, is one of three released engineering projects of the part 50 years, each of which alreed at the oval of a physical obstruction to transportation, at some stranger point in the flow of commercy. These three are the Sum Const, the Pennica Const, and the English Channel Tuner! The first named was counted in 1800; our own extel in 1914; but, proveding to the latest desputches, the last obstacle to the bancelapposition in the British Paritament-edili burs the War, and the extual excusuition of the long deferred Channel unuted is intefnitrir postpored. Had Partie ment convented, and assuring that the estimates of the French and Reitish engineers are not over-experitrains would have been running between England France by the year 1930.

English opposition to the tuzzel, which of lote years has been rapidly decreasing, approachly, disappeared during the World War. This change of opinion was due, not merely to the motual friendship of the two racce as a result of their allied cooperation, but as much and perhaps more to the fact that the develop-ment of arisation has to a cotalderable extent pubbel Great Britain of that insular protection upon which she relied for security. The military authorities, how ever, have again advised against its occutraction, and the Purliament has followed their privice.

Apart from the great crosspercial advantage would grow out of the phility to descratch team freight trains from Great Britain to any part of Surger and Asia there would be the abolition of the delay and ries of the justly drouted Chesnel possegs, teb in certain smoote, the wind and sees are able to put the passenger to more unutrigated adeary than in any short we trip on the face of the earth

Here and There

BY curious coincidence, the same poor that new the registering curps, also put a period to the life of Renjante G. Laune, chief engineer of the Worlinghouse Courses, whose rife as the confession of the Pitte hargh engaciastics was closely analogous to the posirkn held by Stefamets in Schonwinis. No. Lancon died on July 8th, after a stagering lifters of several

ROSN to Springfeld, Oble, in 1864, Mr. Lancon graduated from Oble State Palacette in 1886 taking his degree in unclustical engineering-in these days there was no such artifest on electrical anchors the work to rech degree as E. E. Lannas, homeon, had loyed a keet interest in this first and the year after graduation entered the employ of the Wooding-brane Gospany. He would to this company at a time when little or nothing was known of the natural laws. provides the industrial analysis on a describing and when the design of motors and potentions was on the purely empirical backs of cut-analyty. To him a discentral superior moderned the task of diversioning the factors in giving the Westinghouse Company the posttion which it looks in the electrical immerries.

THE met speciacitic achievements of Hr Lamue's at the Lamue's at the special special special with the one employer were the designing of the World's Fair promoting engineers for Oleum in 1800, the design of the electrical combinated for the first Nagara power project, the generating and englishment for the New Honey electrification the first hig railroad conversion from stress to electricity; the investion of the proven-day situal-plane attenual-Received high-voltage enters mescalide for most subsected sufficient electricities are design of the nest succeedy producers constitut our sed, and the single-reduction-grap street-ray nature, which shough designed to 1880 to settl the standard type used on street pulmade. He was not a prelife writer, but what he did write was details stock-michae the of Me greatest assets was his siddly to get a physical

reportion of every ambigua, and he almost streams to give this in his taper. He seldon wrose teatheractical papers for le regarded qualiferantics as a and which should be past up when the day's week were due; but he was a methematician of complement ability. He was a smally ranteuer of Unrie New's pureer office, his ness living attached to over 191 board

T is a baseleted years show Livelenses Matthew Fortiste Maury lessy them

reservice in compromote which gave to our Plies Charts and developed the sense reason for militar remeis and strangeline which have saved untold millions of Gallers to the conserve of the morid. Now came Captain Epiderick B. Burwitt, Aprillagraphies of the Navy, with the proposal that the Navy St cut a would for adventife passocious in the field of scenarios

egraphy and morter goology. Captain Resett, whose pertrait adicina propries a through ked wiselife coll tion of data entitlements to the latest discourtles and studies that the newly developed scale depth finder, invested by Dr. ninute, or he would be a triffe loss teckions with the Harwy C. Hayes of the Navy. furtisher a routy ments of residir determining dectin of the event with previous arrecopy, and now, as more be-

on the consum of the occum n may be easily delizested. The Hydrographic Office

of the Navy Department, of which Caytain Report to the least has made the profession, studies for the organisation of this admitted their All deportments and extensible continuings of the Consequence have been indied to expense with the Heleganshie Office in that wheelers not competed after the theory are true to called up for consernation and problems so that the confided resignors of generalization and private until the pay contribute and then more the success of the

MUST of the are aware of the last ties, when Pedrol bettle or never mater; is instead the order our be west to Wardengton and her court will be imped to place of an pour's of the rid as out in binetified from there raises. The buttedlate suggestion which on from this fact is of an expert with a coughifulty glass norther court is best of Self in the attenue to may have meet and of what descripation, were its original one This picture is considerable clear to the fac-

then the registrated pre-inic regal enterer. The last of the sturned phytograph, Miss Brieffer L. Limber, in doing exactly the thing pictured. Her be the forested except in the outsin in prcontracting burned break; and she be naturally in the resolut of the Federal Greenment, and not exceed in private practice exhibit to marketer flow 20 but every des that the reconsistent updaet which my have a chain will furalso you with expert aid in developing that claim, but that is what honorar when you from that you hid the figuily seek

in the fire-lest of the furnion, Nie-Lindsey is verager of the claim series. Division of Louisi and Common, United States Treasure, and on her sayes l'Inde San has pold out noch god more to the virtue of the and fined. There are negative stricing stories of her shifty to univer the secrets of

> PROHIBITION has you a number of little tests in the lands of the Fedend attletitles which they have prove had to attack before. There was a time when your Park Scaurle sets owners with the exposure of the firsting head give out of the queries whether the ovgoes their magnituders had been date the little death of alrebally perestingand this favoire chemical analysis. For way of helpful prepagatels, while he lespolyping beeting lease in this expertise. the Federal rocate finds it commission

and extralle to severe other considers to in what I catistis - perfeshols whether it opinios sarrhing pricetors. Dr. William V Lindy, Convincent riveries. whose preferall we show on this jour, has analysed over MAND speciation of backy learning from every sertion of the exectry. Waters are particular interto durage the bootingper's todayes, we take never that \$6 per rest of these margins contribed dangeress me of one way or aparther. Next provide little elemleals as carbolle and hydrochten with, formalirhyde profiles, speings and fedlar laws been behalfed out of support whiders. Asserted the heatinger to superarily codified that nex non-use lefts bern room

THE portrait at the top of the pear to that of so indirect contributor to our extreme. Sir William Brugs. Our regular resident will revoil, from our toron of May, the article by the Ottore Lodge, "Putting the Atom to Work." Though this carry to be without little trations, we were able to illustrate it very handword; with drawings by Mr. Clarworths, our British atel erist, which in two ever based upon Sir William Brugg's Christians better beferr the Royal Destitution. Sile e- ride to make cher to the to wind, in anthoritative Sedora, the wiretife advanta



is in fact one of Religious leading wheating and an of the world's ference; workers in that faminating Sold of about physics to which so many of the most industriens physicists are today gravitating. He Wil dies process our distinction which not all of his research work, he is the investor of a very important assessment for atomic starts, the X-ray apertmenter



USCALLY the ones of the sits seams is marked by the neutrope of the waterpent yers. This year, however, the stary of the sub-nater make has been general by a level. Hitle stranger refer to the wild tale, htendeseted in the hear of a fulry, will known astrowhere identity we shall visak in charity to the effect that New York is in bread nest danger of an earthquake, to be byduced in the corribating of and mater of structural short and show upon the up decising red, of Manhattan Island. As to detict has been received, we taken that

ONE detail which be excelude to the elability of the Beeks Magnistre. If the neight of a mild pare the Pha's peak bull enough to make the under ting strata elle, on aire falste like the Woolworth Soliday or the Pennsylvenia Terrainal bar's very 1944; to arising the result. Abother item about which he wents unitaries as the procure, under New York's secondary, of relian. If the lead upon the unit area were of our nament, the strature of the heliding notify to feered in many come to worth loss, and to ners age only melecular more, than the next rea to make come for it. What parameter of intal law less tion solded over the city or a whole in Lemals comproved in the energies different between the weight of the caloun and of the tapoes of wild next when place it occupies. We should estimate New York's dates from an cartiquate of the connector pictured as count of the months Producer shiply ben't sale to sales to the state, at level he neight take the trouble to culted all the workness data before he talks on subt terrian to Mr field

TITLES M. MANER, of the E. S. Cress Dieze of Approis for the Nevert Cleral, resigned his post in mid-July, to take offert August 141 July Marry Is to regage again it practice, in New York He mus appointed to the Federal District beach by Presi deer Tub to 1912, and advanced by Prevident Hardby in 1931 to the court from which he now critics 14 has distinguished bloods in this court to his beillion intelligence and sould produce the and at the some than he has been so fortighete us to have had out standing opportunity to handle several provinces visit and criminal core in a matter contributing benefit exact the toposoing of important legal principle on the public mind. ther readers will probably know him less through his thorough and ferceful handing of the paints' Bilgation that has passed through his tunds in his resignative the Pederal beach suffers a has which it will be diffruit to make good.

duck entities with a anis of electredes and provided with a rap which carried a third electrody. This fether

tion of Almeric de me exist

tion of Alimon do not exist - at incel objectively. Then are metric products of the Alimon positioner's udiel. These avoided reactions are

wither disposit value And the Abrain

oscillariasi, introduct to restore the proper

electronic confidence in the electronic affing bade, is harryn of real througently raine. The cuties Abranes should both

Make is hid Knelly of serious attention in any of its managers contailed-

bed, it is all an illrober of worst. It has

findings of the Normality Josephan Abrana Specification Presenters, which

printed front They belof statements are based on the

Our Abrams Verdict The Electronic Reactions of Abrams and Electronic

Medicine in General Found Utterly Worthless

By Austin C. Lescarboura

rous, and they, is turn, formeled a rous pleases of the state of health of the faithful. If they well will be patiented, sented out or tutted other the facility of a colle product, and then as the electron are known to be, it was obtained that Dr. Aframs had not a big trak for binned. However, in a

method out a creal prelation len.

the hazant abdomes, due to the presence of these elethe hannes abdigment, sho to the presence of these care tracks makes. Thus with the obviruate source reaching the sensitive siniuminal nerves, there was a narrow change in the perposite new similard. Again, he dis covered that an electrified gions or rubber red would collect strength to certain abstracts of grows and that to others, when the electronic varies came through. 2015 further, he discovered that there was a slight blanching of the skin in a given area, the to the electrodic waves, as well as a respirates of the skin that could be de-tected by the sensitive slape: tips trained in this work. camplidagly short time this profife to There effects in the busines abbuses were given dividual had noticel still a locate of gathering the restrictive exampleses from a blood specimen. Onlines to me of the Electronic Reactions of Ab erientific expertations, it consisted of a

had noticed on a new period of diagnosis, for which had worked out in low inclined of diaglands, for Kitch the nucle European claims, the least modes of which was that life method could diagnosis with given T6 to 100 per ceth utcurring, as against 40 per ceth for the cen-centual method of your family hybrides. He also

cialized for could detect cuttors, tuberco liane in their thriplency, long before ac-thodes, incidence even suspected each tidage. All told, he frankly admitted that lds radical must be short arrive retine

all other forms of diagnosis, which had leve resident hunkrapt, archair, absolute even criminal, in sies, of his scientific Year Life History from a Drop of Recod streets brought out transcens undicat stems of more or low dephetel rates



and desired resolutors from L/Calls of an along to sept. drug of your ideal belongs the latenty. To show The first settled distincted for department the chained that his electronic diagnosis can

nar to the needless track basion, his intest Judged by results it was he far h blos, for it tooks a utilerred appeal Use radio, it less a topic of remages which made it post "even " for the favorthe West Alexanders are called upon to determine the paterness of a civil the electronic diagnosis of a group of blood his technism attracted attention for and The testels of pensature rooses in the clubs that a

cinited that his electronic diagnosis employ him to



er Barcan Investment wild't were been substitute of the contracted in the in part of circumparate and its stilling statement which indicates you have no deather seed, when it made to that the ordinariest seeding in for the indicated spatient, with in all contracted to the ordinariest seeding and the seeding of the contracted of the contracted of the contracted of the first at a view, such "deleting" intige teach in means of a resistance has the contracted of Tick-tocking the patient back to health: the Abrama oscillacian

party that is true in expediting the sealled electronic positions and their applicities in degrada and thempetiti-york. This timestree has similed the technique in denti. This timestree has late spinished thereafter in the Alexan dispress in order to locat bon the and re oppe re them the patient's pelot of Market appropriate for the purpose of first hand and curring thereo. The Complete has ready best-

alth a passive of electropic workers, for the purp diagnosis in the differentiating of diseased blooks and the literal fraction of similar bloods. The formal free his spent over the months in studying and experture Consider he had not in their nich electronics from to bitigar. This Concentrer law student offensel ones. private who chilated to facto benefited by the K. R. A. traiting a sell is with E H A practication through a sell in with E H A practication throughout a sell in the Committee unknown as expression to personage this problem, has our med on the text I and at incestigation which by Albert About the fee has and again in other that he might establish he chara-

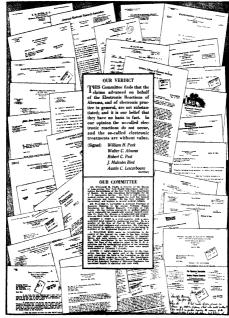
Dr. Victors and Ho. Hosteway Reactions Several many upor there came from Sun Prantisco a times to the elect that corruin by Albert Alexand had electroned a tereditionary pipelish in medicine At the very time when the path's was making me fit anguistative with the electron though at number, therecame the attractioned that let Abane had discuof the role. There electron, he ridged, were the familiation of good breith or II broth. Not a dark of Need contribed collision took relibers of these six

ed with leading sters and the third weight more and Title of an elem This meeting let will gives the attituding batter of referredept. It was in orded the furning in the 40 tules that telefit be present In the bland specimen. A second loss of the vetter kind. call is under to meneure the degree or tiralesty of the division to the timed. Attithe first product to be date; and their may to detect he sheture or offernor

rates tuned in in the refer destructs to helper, namely the detection at the electrade waves or effected rates. Dr. Alexand claimed he last discovered peruliar physiological changes taking



159



tell how old was the depar of the dear of bleed Whithir he was white, black, red or yellow, what discuss he was saffering from now, what discuss could be expected in the future, or the result of their being present now in an incipated home, and the wiperiates of life. If additional information was desired. pectates of life. If additional information was desired, Dr. Abress variable felt for intglast, the notal traits, and com the location of the intrictional at any given research. In first, dusing one at his observant demon-strations he received in photograph of a years; and, placed it in the dissession, heard the penny num to be liberto as the creat of screen republish condition, and then, raming an electron over a man, leaded the balt, handwriting and many other things infinitely connected with an individual could be used for electruste diagnosis in place of a drop of blend. The fising

wis strictly. It berieved on excitibut Bo Dr. Aleston brought shout the realiserder time in modeling. He made it possible for the patient in New York to be examined in the storier in New Francisco. prick his out or imper tip, carefully following the pressive elimethers. With the his above of blotting pager or filter paper, place it in an envelope and said it to an E. E. A. pro-tithene. The electronic diagnosciesa this ideal sectors, places it in the department compets the assuration to with a limithy made than or recent known as the respect, and then proceede to atta-tive year in spice. The respect proposite to the variety to an infected teach localization, as at is called If put have a were bet, the respect has a men nonenty so long as he is connected with your blood mering. Hence the propert to profile on your amount

The Mysterious Oscillociast and its Elusive Ostput Dr. Abrazo did not stop with his diagnostic neckresident that the world would be but little bracked if dreaded discuss could be detected in their Excitency and their care entrasted to orthodes treat-ment. So he set to note distributing a new method of white discuss and upon he reserved to his se-called eriencie discources. The result is the ortificated, likes is an imp world over specified with house with benefits and a

rimaic discounties

Opened up, we find a pair of electromagnets and a rocking aroutists, which ticks away very much after the fields of a pinte student's metromene. The outli-locint is soid to farmed electronic waves of such charas he same to effect the destruction else. waves within the patient's body, and thus centers the patient back to narmal electronic behave. There has always book conditionable masters attached to the oscilladasi Dr. Alexan at first stated that this instructed did not give off electrical energy, and inter his followers statul that if did gare off electronic on-ergy in this thealt, as well as in so many others, there bute and known for what to way. The moment is be minute quantities of electricity, then it is electronic. then radio, and so on. The fact remains that the oscill bests of does not give all any approviable energy. Or the hads of electrotheraps, in which class this insten great would have to be complianted of considered at all periously, it is overlikes: If considered according to Dr. Abrane' own chine, then it is obsige that this

nacking recent do what is claimed for it. Maintaining a first rate of making and localities the absence atoms wifeh artistes the electromagnets and racks the nester arrantees it is will up-posed to produce Night frequency many or electronic ways of millernous rules for quetry, and ever quite a contaile range to do the nork classed for a feet the only news of verying the water length in a resistance bear and unlike the ordered phone. One on illustration terranders the may of which is turned the is given patient

At any note, the many about of the secilorist is to obe on those mineral electricals conditions which are legal in your bland as the result of the electronic dispuseds. You have been not that more Med distinct mappel of or Brief hed applies to the extent of its slare concer. 11/25 ebens, intrevaluels l'adustercorse, lamified in the her binds, obser, and so on. All right in chape t obste, nod so on. All right in ringe the short H1 Box can yet be cared. These things don't look so good and too and gardens to get rid of them. Your derive fells you get to worst, but the electronic wast knew better. His neited is - far S. A. HAPPY, MEALTHS

ELECTRONIC TREATMEN Saved Her Life

CONTRACTOR OF THE PARTY NAMED IN

Dr. Geo. D. Gillespie ***** 478-465 GBARY STREET

n which apeaks for sa-ction of a half-page after the "San Francis"— post Typical electronic literature which apasks for a This is a facainally reproduction of a half-pure at toercost which appeared in the "San Fran Chronicle" for May 11, 1824. Note the pono trade for electronic diagnosis and tree freetisement, and E. R. A. under ter

about of the facility factor with his grade at The constacing E. R. A. Districts has no

The countries as a common me present of you.

The newer is the coefficehet. You begin with your treatments. You go to the electronic practitional cabo, its for or more often per week. The electrodes are applied to your body as you all or its down is one of the little treatment booths, and you peeche the south-ing electroir source from the measure coefficient ma-chine. In your loots there is probably the tuning unit. the little light of which bitals at you in stop with the entillednet sirk-lock. Otherwise, you experience to securities whetherwormal least, not if you keep your

At the end of one meets, live treaths, att matths or their, the electrical field yet between Ten thererised extent in the matter out, cannot gree trailed, cleared as Ten "rec"; he redwed three to the vanishing point. Your occupation yearling he proteinty gran. Swhapp you for such better that when you fivel legal with the treatment. If m, as and the better of first, it is no belief the invariant, because all that treatment is timeful for furnitions, because all that treatment is timeful. At the end of our sweets, two proutes, six you front in your blood. Once there are stood out, the electronic has four the work. Whother you are reelectronic has done his work. Whether you are sterred to restlect health to not be a secondary tool so far in the electricals thesity is come

The Old Game of Follow the Leader Attribued in the sold tight of edentific kne

tie entire Abenus morter is the height of absure A sweeting continuous of the support assemble, as well as the safety of the support as seen that the subsect of the support as the subsect of the support as the subsect of A superficial examination of the spectrum emiles of Pertuses, devoted the major part of his publishing as well as belowing efficient to furthering the electronic custs, and he has been followed in this work by Lanes, publisher of Propose. This publishy has been instru-ctioning of the publisher of the customer of the electronic customer of the custo

Postal Subways in London

THE drawing on the facing page, property by our limited staff until Mr. N. W. Clairworthy, shows London's new Post Office tube reflorar, now being fitted out, for the carefage of purcels and better mail, to exp dite the service and reflect either congrettion As yet only the tunnels have been completed, rue from Publington to the Rostern District, office. which has been made for future branches, the whole proposed seeing maligning from the chief narrols offer at Meant Pleasant. To this end the temperature been truste herper, with space for additional lines, thus will be inspeciately preventy. At property points onethat existing passenger-currying takes costs the late of the proposed mail takes; but New York, with its re-

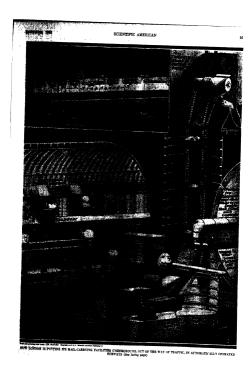
macrops embrary crossings, is sufficient proof that these are merely complications, and in no seems obstacles, The Post Office take is to be, of course, electrically operated; and except for the localing and unleading of the wages; it will be enthesly accounted in its fuertim-

Will be manny.

Ing.

The tuper panel shows the general arrangement of the tube. The balance of the four-superment of the tube. The balance of the four-superment entire pre-sensation of the arrangement of the Edward Building Sixtien, situated because the Gonzell Post Often. Bug of the country true go doesn to the station by South the consens rose (come, neger or the small type go does to the station by chain (it will be reserved that the British spotting of this word is not quite so app-paratured as is core, and we have left it best not to tasuer with Mr. Clasworthy's best and to insuper with Mr. Characterly's original disavingli, and come up from it by discustive. The silectrical opologonal is on-tended from a small control cable at each station, each operator occupiedling the sec-tion of line tributary to his own studen. No drives or operator of near near his driver or operator of any aut goes through the tunnel with the suggest of trains of suggest the grant this respect the grantess is cutie like the American ordered in gother like the American ordered ed air tube for the te







Left Gridday the logs true wood meal, which will become puty on sublition of water. High: Swatter and assessing machine, in which the wood and water are brought together.

The first two stages in the conversion of logs into paper.

Pulp and Paper

What They Are, How They Are Made, and Some of Their Uses By Issuer Ginzberg

APER to one of the word important contractive manufactured. It is leaf to consider manufactured. It is leaf to consider an another word in the condifferent place to the lit. When we step is put, the many different stops in which we need in contact with it better core every diffe, it is leafled to see but how we would do without it. Right in the supplied to the leafle of the contractive of the contractive of the leafle of the contractive of the early digor to

we not how we could do officine II. Rich is flowed to their litteribility to a sequention of the settly days of their litteribility to a sequention of the settly days of chronictors, the became man of the day, the nonzero defines had use became the settly allowed the settle that the set

one we now any exception to seeken instances. There is no ways to who have been proved in the control of the co

Partherance there are let New who have a common convertise of the executive of the paper Industry, and of the great care and trouble are entailed in manufacture of paper. The workeless of paper that are remarkly used, everything from a title weedling norm play poor for wrapping lower legals to the thin. transports complain paper that is used to write cataly brain and that index like a TITE ONE ordered rather than juper, she extremely large. And the conditions under which each reads of paper is made may, the ness wary, and the ourtals that are used in its apportune mity. This place a very nearing present

which will be movely neared upon in this article.

How of the paper that is manufactured in ranks from wood. However, it is very



and outer beauty as the water, and the control of t

It is wey literature to have that it again of the precisions of most let the long or on those of the precisions of most let the long or on those in most control of the long or on the large control in this country, it has been control of the long control in this country, it has been controlled that the precision of the long control of the long c

of girtyed in maintar awayayow. This is culting mechanists at word gails. The word in a reads. It is may be instanted and it benedies and its made take a gold by benefits of mainty manufactured dies appear on the paper-maintains installation. The redugence beek paper and investigation of which is used to much these days is saids from two the control words.

There are also varies cleanful ways in which the

are terrors contain recel in which is taked. It are process salitio layer, which is made by also received as the contained as the latest in 1920, to it weeked for involved in colors as the contained as the contained as the contained as the processor in which this received is used. They of up an analysis of the contained as the contained as the first with a contained as the contained as the first of the cost interesting date experting the saltice of the cost interesting date experting the saltice of the cost interesting date experting the salfice of the cost interesting date experting the saltice of the cost interesting date experting the salting asterior than the cost of t

cereas, due too last, or has been empired to instruction to obtain an inspare etch action. New saces are being found for it every day.

Another lated of path in made by diparting the wood with conside lay. This process was invented in European II 1884. The apply obtained from this process is easily blooded tool in superposed in the manufacture of

processing the second of the control of the control

played in the insancheto of arrang wrapping pay and begs.
There are other process for making chemical pultut so far these have a been developed to a co

mornial stage. One of the most providing of the prosense in the chlorine process wherein the wood is exhijected to the action of chlorine gas.



Socie: and wood piled for grinding. Freepressel: Ground wood piled for winder san, bering there will do said of the converge above at the left.

The stack pile of a typical paper sell.

Not all paper is used from wood. The finer grades of writing said yelecting puoles are manufactured from cerem and lights maps. You little paper in saide that mainings 100 per cent may sirved. The usual practice is made and manufactured with sound page. Paper certific and limit right. Very little paper in made that contains 100 per cent may stock. The usual practice is to rait this high-grade paip with word paip. Paper made in this way is very circuit and can be bin-solved by perfect withstease. It makes a were fine writing paper and is size employed in printing expensive books. There are also other materials of interior properties to word that are gradeally cooling into use thoughout the world for the materials cooling into use thoughout the world for the materials or super-ties of the control of the control of the control of the test that the words which are particularly well to the per trait the wood with the particularly was saited for paper making, such as poplar, it, block, agrace, pine, heater's are becoming source and amount each year, although referentiation, carried out as a bound, acceptable basis, will provide supplies of these

count, scanning terms, will provide suppose of tasse woods in the firms.

If the firms,
If the first in the supposition of pulp-icited of vegetable sisting as possible serrors of pulp-it most be reasonabled that theoretically any collisions If most is reasonaired that the critical any objects in matter, such as contrast straw, the strike of the com-plant, reeds, prasses, in fact anything that grows and contains collision, is potential paper stock. The regards why these cheep materials are not used in benatice throt grows and The require not contain enough religions to make it worth going to the considerable expense that is establed in named and which must be eliminated before paper out

Nevertheless, paper has been made from sterse, especia grass, which is frond in several Kuropean constries, barshot fiber, steps cans hagusse—the remains after the sugar has been extracted from the cane offer the sager has been extracted from the cane-pant grass reeds that grow in certain healthin in krieffs, and other shallon products. The papers that are made from such materials cannot be bleached with-est the consumption of condensate bleached with-est the consumption of condensate bleached with-est the consumption of condensate land are powersity comes and of rather pure quality. However, the obsenue and of numbership blooch and are well y ourse and of rather poor quality. However, products are paper and take the place of more en-sity papers made from wood. They are satisfactory for certain purposes, each as wrecoing baselies, making ers, carriets, and similar products.

Before considering the various new to which puly and larger can be used besides these that are commonly and paper can be used besides these that are examing haven, it will be well to revolve in five words the paper-making process. When paper is made from weed, the word is first guant op and eldpect; when it is made from other materials, the first step is always to con-nicate the series. Then the particles are treated with chesticals in disputers. After the important have been critical with the contract of the contraction have been critical with the disputer. into bestern, which ruin the stock by subjecting it to a constituted everywhere and shoulding action between steel blades, fastened us a railer and imbedded in a bed-plate in the botten of the benter. The water in

witch the stock is bearen in caused to combine with the fiber, which becomes livring the course of besting verious substances, which are employed in changing the properties of the filter so that variety kinds of paper can be mode from one and the same stock, are added. Thus in stock, are added. This is naking juper used for writ-ing and printing and required to held tak, reels pointed

and sulfate of alentins are added Coloring toutters of

cases it has been becoming to min water-proving agents with the puly in order to punder the product resistant

to the weather.

In America experiments have been made to make an America experiments may been inque to make building stone from pulp said were secrete has been obtained along these lines. Outposition doubting in site made from soul pulp. It makes a very the faceling which can be existed in the mass in permanent shades. Wood pulp is also used in the manufacture of top and revailing of various sects. It is the starting point for the manufacture of celliploid, Chilaidd is nitrain critisise and has commenty been complectured from outline liniers. The attended product is induced with compliar which gives this rather remarkable substance.

used as a rew material to this strooms and a good strade of cellulaid can be obtained led judy can also be used as a vicetag potat in the but tues the complete, but boards, and other parts are

The dry and, where the paip is delivered in about form after being relieved of

less proder. It may also be employed in making artificial silk. The pulp is dissolved in coastle sole wisting which is also said to contain a certain proper that of cushen distrible as well as other impediant In a break place and the bessing thread of material b in cased to congulate lists a stable sub-tage by carity in cases with alcohol or other similar lists. Then extremely this fitnesses are then constitued by twiether into an artificial allk thread.

lists an artificial with thread.

Home, unbraide of all series, different articles of every
day one can each larve been made from paper pair. For
this purpose the pairs must be waterpreaded to be able
to witnessed the action of liquide with which it evenin contact. Waterpreading can be acceptived in a
variety of water, as for example, it impregnating

was deather of a service and the properties of t

injurious. Old newspapers have also been used to p test plants against the cold during the frosty highes of ity spring. It is not new that paper is steployed in making civil-

ing, but it may be news to must readers that us at-lemp! has been made in this country to manufacture entirems from paper. The paper is waterproofed and the relaxest made from it is supposed to sell for about 25 or 50 cents. The project search interesting for 20 or 60 cents. The project action interesting interesting the handly practically still it is possible that a paper relational may serve for one usage gayway. Carried in the pecket, it may easily the women to length at the sale when easily the a salden planner. per is used in the manufacture of good as well remor coulity show. In cheen show it is not surreides to find the seles made from paper. In good sheet the

> ude from paper Paper has been employed in the manufacture of various technical penducia, such as palleys, our wheels, packings for gas engines and bydraulis medizery, calender rolls barrels, etc. It is employed is making speems, dishes, tranks, maticases, cups, not-errs, table creens, buts of all descriptions, artificial flowers water palls, elected lines, and tation tapestry, etc., etc. One rather interesting and

strange use of paper is in the manufacture of piles. Piles of feeks and wheren and it appears hardly possible that paper be employed for such a

paper to employed for such a purpose, as it is commonly known to be rather weak in alcounts and extraords absorber. Her if the paper is compensed under great pressure, as is used, for example, in making our wheels from tills substance, a product is obtained which possever a superiolsy hardpen and residence to sour and tent. Partherance his periody is related by such free, the control of the period of the part free tents. In effect which can be easily established by inverseesting waterproof agents with the paper or che putating the outside surface with a water the reason for using paper for this purpose is that seathe laring wome, which do so much damage to wood

this hering worms, which do so reach dataups to wooders plick, have to effect on paper pides. Fixing has been made from paper and products have Fixing has been made from paper and products have been developed which are in paper and products have been developed with the paper and the same at most and to underson. The media of the paper can be cut for three far min pipe connectively just the various at most. Highest and which themselves would not made from paper. The imprecision on conduct, currying the trade-parts. The imprecision on conduct, currying the trade-

marks of the makers, is made with the sid of paper molds. Does forms can be made of paper by passing ground paper over an undergarment and then reme ing, couldge with sheline. the interesting namety of paper in metallic pay One intervening variety of paper in meninc paper. This is used by evering paper with a neviality file which is applied to the paper, which has first been covered with an adverser century. The neviality film

is then present up against the adhester and fixed from in the paper web by cold pressing. Paper as at in sultator in which remaining in the abstract industry. Heny special varieties of paper are summitteetured, selt suffice for particular purposes. Thus paper is such salted for particular purposes, much with Informent courting its speciality is elected of cellulars account an experience and attendant the selected to respectate. Such paper is used for decentive effects. Paper with a heather-like finish in made by spraying or painting with special warnish propared terd for hinding books, covering walls, upholestering furniture and other purps hald papers are sometherwised on apecial practition and used for whether perpose

ed for elector purposes. While real colluisid can be made frees pulp, a cello While was ofmind one be under free pair, a color del substitute on such a manufacture (the paper. All substitutes on such a manufacture) (the paper substitute) which a counting feeting such as the substitute of the minimal paper is also make this is counting feeting materials until a feet of the substitute of the substitute of the substitute of the substitute from the date of the limit for considered him position of the while the substitute from the substitute f that it be no surprise to bear that the total quartity of paper made in the world in a year's time is as areth

on Syntheen selling team

Re-Broadcasting the Broadcast Program Short-Wave Radio Telephone Transmission and What It Means by Way of Better Programs

By W. J. Purcell



ster unit of the 199-meter WGY trans ring the water-cooled takes, one of which is use ciliator and the other as the mos

the nearly ground extraction—to rease directly under-testic the center of the untersa, greatly increasing the residuates efficient of the society. The universal is 80 for high and 60 for in width at the top per of the fire. It has a freehousehol warm beach of 180 safter by because on level greend, a selle from the nearest building. The building is brusted near the band the Midson's river, and renderivity of the sell in the tricking is therefore connectively great The ordificing spaces is of the conveniental of talt rather than the entiress circuit, greatly elling the possibility of frequency change due to the swinging of the agricum in the wind. The printer

cell consists of one and one-built terms of recover ribbs: two terbes wide, and this is raped by an air rends nucle of aluminum plates three feet square. In solving the problem of a manur for these photos that would not break down, the use of very tide hard rubber sirilys was decided upon. The power takes are of the water-

conied type, connected through a pump to a large radioter which lineares as uninversited water agoly. The strice unit is suspended by springs Owing to the extensely law wave bright used, notice

hand. Metal peacils, watches and like article he curried on the person because of the small spe which Jessy to then be with became of the size experienced when were steps on the natis in the wooden force. The modulator tube is water-cooled and con The mornisate tipe is winter-your and con-to the same cooling system as the oscillater, speech pener amplifer is a 250-cent tube, and, be of the instease field from the oscillator and its asse-arguments, it is shiplified by a copper but to pr apparentes, and the resulting less in quality. Al expected to the sunfilter are shirted, while the line and are harded to present the radio algori frees settle burk into the input circuit

The triple notice study to the water-world tribes in a time-place full near rectifer capable of supplying 30 kilomotic pt 15,000 solts. Filaments are lighted by special direct-current marking to eliabate the rippl which results from the use of alternating current or tubes employing a high fits seen current The results obtained from a series of tests condu with the expension of the British Broadcasting Cur-

puty, from January to April 5, here been extremely graffying. The signals have been beard conductedly in Low Apprior with least species; strength using est in Los Angeles with load speaker screenin using way two tubes, and this at times when daylight covered the western half of the coals try. Tests here skyret

that the signals are re-tearisably free free failing which is experienced the larger waves. the atoms dinner of the Massachusers insti-tule of Technology algoric in Now York, WGY can nected to New York by a special circuit, brustous the privir and speeches or 350 meters ware length up: on 107 percent. The sig

Granut Electric Com at Oakland, cought

bargh picked them up and end than to Heatings Net, which again rebread

three-tison-relayed eteral an delicate receiping property and under year

dinner program into the sir. The only wire used we that between WGY and New York. The evaluating regard by over-water transcribeds possible the new of one sends for a number of re-broadcasting stations covering many sertions of the country. Then the problem of getting taken for broad reading in heine maked, since have surface out observed.



to really clotted the present your has been the drawing or the present and appressful countries. sheet-ourse immenditive.

nucled on long wave lengths, lines core-reality according with a fair degree of retigiality that it is pessible to pick them up 3000 miles away and WGV the Schreetisty sta tion of the General Elec-

tric Conquay, has been experforming with a short wave immeditor, and on April 5 these communities with the Reiting Breezeway ing Conquery in England. reached a climax what every statton in England retared or retrookast the WGY short-nave signals A nothernes best-of from Letter thring the prepare of the never, rather actionis produters in hill

as river as if played in Leaden." The concert broadcast was bold in the and speech. The program was retrained by little of spits to WIZ in New York, from which politic offertion. It was regarded over with to the control ross of Well in Sciencetah

breatise, that is, on a short wave length of 107 meters and on "hit meters from the regular transmitting earlier The dust wave length eigenin, insuffice on nicked to on a warding region in 2 List in London and were then fed in mire to all the stations making up the British Brand aving Compute group. Crist net refer in London and Kadels-on and other puretemption of the number placed in New York.
While the sheeps of a short-some transmit sheiler to that of use to codending we, the reconcepts Not invented modern \$300 kilonoles (2.802.00) int repairs the and of sease deliver and Read As should in the accompanying picture, the ablence and to of the Lat type, but it dillers in some germen resoluter leves, its renderters are under of three-sights inch hence over which is braided many gas simusts of lete expert wire. The two wealth the street of here report when The two a ecounty to emptyon a structure of tide size, but the are constitut to present the antenna from walkaday

Subsiding universe results in frequency clamps, and in turn mess, water length election, thus interesting th proper receptions.
The insiding that electron the transmitter groper in located slightly to one side, allending the constrained



Fig. type antenna used by the WGT 100-motor experimental station at noteston-are mode of 5-inch homp over which is healded many fine strands of hare copper wi-limen. The antenna is 80 feet high and 60 feet wide tady, N. Y. The or

treat offers are patient. In heliding a tru many practice is to cornect all metallic objects, such malons frome work, transference cases and motor groon join frame work, transferent cases and latest give-cratest frames, with puper childs. This providest cratest he followed in short-wave transfell-shift because, while like industrative of a conductor only is few face. being in were small, it is great except to allow a convoltage to be built up acrose it at this Recurse of the intener field sixed the tr is property to observe great

custion while the set is in opening. Two non standing on invalued stools, each holdthe a metal red to his bond one a victor for in the biblic. one draw on one six librius long between the male. No dock is this because current of this nature transis through the skin rather than through the body. However, if the tere hands were used findend of the notal rule a sensor-burn would be the result. Area will Jesup from the stone cost, and care is accessely to prevent the body from continu in contact with our pertalli in contact with any law and objects. It is possible to light on collassy di-watt electric lamp to full brilliancy

helding the glass built in the

s and Pla og to be more and more pene of smad in b present to the health and occupient, as the occupants, as is any other features for which the designer mans pro-cide. The nervous brakes, and irritation resulting from praisinged effect in hear under poor hearting condi-tions, the wear and four on horses, produced by the interestable in racket of a scottern offer, are just as destructive to brauns efficiency as in increaser this line.

poor whitlactor. It is not sufficiently well known that the prob of the control of round in buildings has been word.

The control of round in buildings has been word. Tag acception were necessity to this accu-tion, as well as the practical application of the method, is largely the work of other man, the late Professor Wallace C, Sublin-of Barrard University. Takents deep years of the reet teleptables and careful in testigation resulted in a onepiete theory of the behavior of segand in recent, the excellencement of a working criterion of carrifture of acceptic empirious, and the relogatest of a practical torsion of sewrite designal mouth

Perhaps the most opportuniting gon satish from Professor Subles's work in the deconstration that the absorption of segal is of prine imperious in the cut-tual of newstic condition. Nest of the serier week at the problem had been in the direction of control of seated by re-Serting from property shaped continues amplification by artifully designed want ing beards, and direction and control by properly curved walls and collings. Quite in contrast with remembly screpted to tions. Profesor Soliter from that gif

firsity in brusing in coose priority re-rated from too most nother than too little want. Notetific incomments in reveal years have deach instrument. The rippoint investor of the e-coal of ordinary conversation is of the order of a suition thorn the limit intensity which the our can don't be because one, difficulty in hearing and understanding special rates and on much from a lack of history or frein a back of distinctions—that is, of complete report trailings of weighting good longing conditions in a pools is a garee marrier of insuring that each separate connecti of speech or practic whall not be producted from the

eding electrons New this probagation of sound in a cost, technically known or restriction, is respectible for a very larg properties of the case of failty accorder. To deathing power of a serface may be defixed as the readurt of its uses, resittetion by the fraction of the sound energy that is absorbed each fine author erifice that surface. The absorbing power of a room is then the sum of such products for all the surfaces, wells, ceiling, feer, furnishings, and occupation upon which went writes. For sound sources of ordinary teams, such as a load specifing or whating paner, spon as a total sponsition or manuscular votes, a virilla, or an organ pipe, the lisso T of reconstruction stepends assists upon the near's voture and its total

shorting power, and out he computed by fremula. Experiment in a large name her of rooms has shown that for authorities conditions, the value of T absuid by between one and two excepts. If it is more greater than this the "ring," or counteration in the man results in con-fering. If it is much loss, a noticeable effect of Grilleres again newalts in orth Clearly, thep, reverberation in a n

may be convolled by serving the pager ratio of absorbing power to volume. The modern tobolecy toward the use of very hard interior-daish materials, which are very highly redecting and only elightly absorbed, is in the direction lecting and only elightly absorbed, is in the direction in A distrates of shartNike power with a consequent rease in reverberation in recass. Recognizing the finishizity of a moterial that sheed to intiply exami-serbed, and it the same time entirely effectively effect being invested us consulted the last is sively to the consequence of the consequence of the consequence of a sheechest as the usual mesonity entires, and

irable esistion of the prot d acception with good construction.

I much for the structural elements; but what of widthe surfacet. The ordinary planters, penerally within subset only two or three per cent of the

acted that strikes them. Research looking treated the development of a planter, to be applied to the usual which should be much more highly absorb than this was been aver that four your not of the ories, a general description of which was given in the Schwertz Awaren's for Secretary 1023. The physical properties recovery in a material, that, when plactic, can be readly handled with a travel, and, when hardened, will be blable absorber. are naturally antemperation. Either property nime on be readily segged but a combination of the two in the soor material was found to be differed; First, theregiging study of the chemistry of placer bonds



their relative tetacities, and the physical, and elem-leal changes involved in their "betting" was made; and it appeared that a magnetism carcinolide both was bed salved to the purpose in hand. The choice of a restable aggregate called for a long series of experireceive, explicited sing from linearmer convertient final proved to have the desired qualities with the require Percel to have the desired qualities with the required lagridates. It was been becoming to neek out the people proportions to give a motter that can be easily boulded, that will have the desired ording properties, and that will field a planeter with the required hardtive, fetter and oles, and at the same time with the scraptic properties desired.

Haring period of what rubbt he called a so formery belongious weighten of the analysis, the question of a practical demonstration of the associate properties of the new nativeful wase next in scaler. For this

ornamental countries made by a new process, a co

purpose two rooms of the same size and shape in the new inherancy were available. Our of these wa-finished in the ordinary manner using hard placed with a succeeds data. In the other, two coachs of the With a masseth fished. In the other, two coasts of the sound-absorbert sambaids were appelled to the secul-lemental' coal of softmary placets. Otherwise the southeast are distincted. So interneusts some the our is required to detect the difference. Hack of a set of coaltested organ pipes was matched accretionly in the test means. The time defines with a

the sound remained audible in each case was most by means of a chromicaeter especially contracted for the purpose, and is requested in the American Serbitors

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by Professor Arthur L. Poley of the University of Indiana. With a pipe of frequency 128 (viteralists per grounds. With a paper of recipenty 128 to the contrary grounds, the world based 8.22 woulds in the contrary many and dell secretar in the other. With a Middle pipe of 256 frequence, the temperature three were 250 and 250 seconds. For frequency 512 the three were 65 and 131 seconds, for frequency 512, 52 and 63 seconds. With frequencies 2048 and 4500, the ordinary room pure providencians lasting 4.1 and 22 arounds florly, while in the other the duratest was beshort for sensorvesor! Overgubility much from these ng similar tests show that at each trifection from IV to 30 per cent of the escand energy is absorbed in the special photor so executed with from two to time per esta by ordinary piecer. In addition to the reduction of ranse

reserve alog with the results at explosion of week in author more, in alweign surface for walls and cellings effects nery amiged decrease of streetly of sound from a populate matter operating attitude a feet. This is the result poets referred to show, and finished in the colliner number, the click of a type mriter less some flue or ely seconds. of ther the sound that is produced at that thee plus the residence from sounds name Ourney the fire or six preceding necessis. The total expense of seared in the room when a type-writer is lettly operated continuously in about the three to your as the second given out at each other, of the interviews, and it is distributed above

uniformly throughout the room. As a result a large offer until is a perfect bed has of noise under middle hasses terreare were and became efficiency falls of modelly. rapidly. The mediatese of a structural will element most of this is obvious The head of one of the largest hospitals in Chicago in respectfully for the statement that "notes is one of the granted curves of the modern hospital". The head pital exercise with its exactable and walls, and absence off any absorbert auto-tid is a 100 per con incasultier of any absorbert auto-tid is a 100 per con incasultier of arise from room to note. Here upon the valer of a sensetural auto-tid that will instruction there with One might elte a large master of carry in which a chang, personners, and reality applied neutro of sealed absorption will be of distinct advantage. The reality wings alrest dark problems, where migries calls for wants attend that produce, whose might calle for each a seaterful, and it has been rusher through the Standard and Incodes of three descends that the Insectigation has been carried to a point at which a

> Cast Up by Salt Lake WHEN the agree of Salt Lake, Dish, reaction a temperature below 20 de green Pulmented: It engineerings author entities and accommissingly cords it up of section exhibits ean be guthered before If you but into relation loss led to the cultarmation of a pient for her resting and refining the naterial fate a conservation product. The average period of production will be two months early year. Itering

is where of tells where there may be nonproduced and during toxes of cold wisers für sehme suffete may be presipitated für tiere meetle, Judding by westler proveds of twenty sense A New Principle in Concrete Work CERTAIN black of devention energy for a realing the next, prished surface the

seets on de-makin in places solver public entered in the intendered attractive. A New York Impair, Mr. Nethon C. John son, has been in top to do the week well that it were. He might, He has developed a first (which is related of ways wert) Of which rewards concern makeurs. Its most value We characteristic is that it repris cruses! When the arts of the weeden focus appears the faces of the reto on which it is desired to have the neithful which are pointed with the solution, and the exercise is poured in an monal, the overest in it is boil your rom the fierre about operightly of up then upti in the former about obserightly of us their uptil ing has taken place, while the politics now not result. It is shaken that the cost of this work is best aperished of the cost of motic of a shedder motors a fine to come to be



What the Other Half Eats

Some Interesting Exhibits from the Foreign Food Stores of a Big American City By L. Ledina

CS upon a time. If one wanted to est, obhad her two elternatives—one might out it show well bear, or one reight well a regular reduction. Darkading the branding lease in the frener entropy; and the ing loose in the feether emergery and the latter in the latter, there was nothing in on the two-even the valent that served "not-executed as a restrict. But fails it is not management of a restaurant The so-called lakery hands or hakers retourned has bed an executors development in America within two fevales. In all of our cities, the bulererrying every publiculty-ond beking is received on institution of nationalities—have gone in for this form dollar of proft, perhaps became they had all the part of coolery and all the finished products of the bake and so could not resist the suggestion to by their one lack at dealing with the pittingle consumer. The result is that see interested in the curious food predictdescribed in this journal, from time to time. weller man anarchisest with these convertibles and sweets in the Satelan-colory greety shows, led equals starts the balery resimpose of ferrim constituwith state they must be mounted of foreign cowling to

have been made where earliest antitrates; and today are negative invested and sold strong true-and

diles. The Chinese Lucy dryness is my brett-and toppiet to slav is nithest strange units, in fact, he bloodf manife selfs make age tors stell similar prodnote "in the side cutainer literature beide Asy spanis at the heatens delectable removed tilly but cores and then or single heavy. The gran-ular form of the will chief directly in the final need net Samethren cherry three date eags, or pains

holds its fraction and Acres to the last season. the original container until used up, being kept the raped by roved rold at the table would from the out.

as agreeably tasting years confection. The nurseable is native a singulating redden-tion, executes tracky lark in parts, due to the dark celes of the wild have used. Its appearance neededs one necessary of the cluber black-cornect preservwhich the negret moves in lightly than and boson Newly spence, a container sense a whill of one for heavy opened, a contrattor within a wind of case the presser-livespik the reason; it is, of energy, not the other of the fresh host, but no freen a bunch of rewn a day or two old. Take pre-defend oter sevan to introdify the amortisms of the internation, madering it too chantely stree for were palates, so it must be used sparingly.

From the historic Tagris-Emphroise valleys, as various valleyed of the Tarkish republic course a sold ner ascralate in 25-years not level. It is of better speciative than the transposite article, but its sta-retained it less extraolists. The fragrats while ruses readers it less estimates. The fragrati while run-fie with the Denaway region is fraged are size part: the secretary to either subta mine or extrast star (12)- last much extremed in the Good; setel, or the processing and, or the nonlinear of Asia Klass There might be an lifes for home consuming in there has marmalades. Wits should they not be made in American preserve function? Their continuous salfor the part half-rentury or more upong the easily critique of the Dalbel States is street that a density

First having a service of goods on their the relate them find a restrict in place of a low.

A capital marinabate from the payme fruit is instant in France and sold manag Guille haporting proceeds to Manhatten's ink. A shaller article from Boaste is made from image, and is sold as choose—you get it with, a knife, using it sandwick-like between thin at of broad. The less occurs from that city of pages disease which is known, just at the non-Lettgred

feringers. The property of the second of the in new produced from the stange. There his fellows known in the Settleb Let

as breed broke any arroy experted; but our Italia cimics jupor a cill ligger veriet; ly the hundreds flows. They are always in the dry from; and, dry, one of these approximate the site of a build-dist. This is probably the next expensionly worths of all It is tody and natritions; a medest-siz while cucked and leathern with a place of level and

pairs, country into reasoners, first a pacer or treats and a glass of salls, will form a negative seed. Our own farmers salpts profitably grow these beans right here; the saver so, where salpty of the imported hig begge ure indexed with become of one wer or against which in this way got rested in American sed. We have etample depreter plant-novic printers bringing to any party from alread to player ser furnies.

The playering is rated

strong the chalcost puts of the uniteree. A picture is shown of the fruit in the perere reddish host Americans are best ac-qualities with this next saliesested, but the Araba prefer it as it grows. It is an extremely pretty aut; fix sun-ident enter skin, of riscoing which we get apple than in any other

> Stringing food pres or deploy is opposed to the dried sizes of socialnibe: and ever soul fish strong for drying and exported these

und kurter from at Greece, and is a recet



fell: Pide his tota from talk Miles, in their varietiesd bade. Center: Econopial marrielels from Olita. We exactly of wil processing in your with one fragman. Right: Etning size, unbersely soil than in Andrewskin.

ands a recent" for lawist in its high satellive value. The implifies pend will food of great worst, but this is,

me class with the sums your about fulnot to speak of the moleg in general. The shellish known as sen urckins and rener classes for familiar sights around New York's Mulherry section, but are of little senamic worth. The nature logical stores that handle these self the buffing logical. we had seen seen it. If er, it ben't sivene ne to see a thing in order ceps as fat as a placep buby's arro-so hig that one eight be perdosed for reducing to believe that a fouch or over attained such size. has better and all of life ità. Berry Ford has probobly tried very hard to. Xrme

the hundred or so queer types of bread which the world known the Arablan broad shorts any the stema-est. A compact of wheat their and salela strap, just gan-dried, those can be kept for years. Many of these them can be par either in the bakery

restourage or in the feeding precept stem. The certains as feeding the service of the feeding precept stem. The certains as feed (current, attend in their sem jaiced, however, is artifable only in the French buts slope, since the cooking is the whole story here. Only the French chaff seems to know the secret. Britler-Scenaria prime other disk highly. It is Brite known that this horses entered and a couple of years of calle in New York and meeticat in 1784-08. While in Manhattan he became rgn down financially that he had to play in the backed on Thesiar Alley and gave this little enemy in Sewy-town New York its mann. He returned to Present of the Control of th ee after the death of Bolespierre, and in later

Finance after the death of three-party, and its limit years were a charating recent of the and heightellig in the Connecticut valley of 180 years ago. Let no reader who can possibly find the French cried on you coult trying this delicacy seem in his life. I first clief is in Preside pressured in Houses Allow, seem-40 years up, mode by a clod from Pun, who had a long tradition of service to distinguished French spicusosis refres to bother to energy, saw proper species selles tolded like.

These food carine of all bothers, many of which have

teen liberrated in these pages during the past decade saight have a consecutal value for American for stages may be eccusived the transition of American their stores as window displays. As there are implicated of these articles available at all times around the stores of the foreign column, the socialise editors has a large feld of choice. Exhibits which are likely to large field of choice. Exhibits which are likely not cause the presency to step with the combanation "filed in that?" would include the riseast Set-Sauk dask eigen of Chine: the dried and spirted class of diagnat the desircated oparent of Canton: the lock two of Nanton: the bised beamd of Finland the checking cause of this, down up in source sides; the laught of Neetland, looking like a beating given, the same-while land amongse of Sigliy; the white attentioned for France; the agricult sheeting of Turkey; the dried bed it shed form of falls America; the barica-band flat-of the Segnillarian countries; the naveogra curse of or the Negatinesian contribut; the navogate cases of the Amino; the cases where bend waters of the Justilles-and so on though scores of others. Those mentioned have the meet of being keepade for long periodic score of them industriety, and all of them have been seen of them industriety, and all of them have been Distrated in revolue contributions from the present

Face to Face with Vitamin D

OD chesists have known alout the several vita ndes since quite a few years, but Decture Hot Kerr and Williams of Calenda University see the first the here seen my of them. Viranin D, searching celled "Hise," has just been isolated, seen, handled, studyed and observed by these new. Tale number of dwelle is the one without which not use it alors calaries. Some west - for as to tro to 200 on



SCIENTIFIC AMERICAN Vitaseln D; but

bare known net all, but quite a lot about Vitagele Dr but

es, both of them confiner

to make efficient over of it with the vituoins. What good is it, to know that Vituto D when believed in a

errorelita, white scholage

The largest beans in the world-habitat, Italy

which looks like a dose of catalog and which on than that, you night get warry or vickets or a trained made in a greenfactor outsided formula of GH_N_O.2. For caused set in could'd, if you do seconding to Dr. Kerr you will outsid it. It can't be or own heri-bert. In other words, these diseases taky mits were too preservings, too elumber for the chemis late a putest medicite-or suffer it probably to catch. But they did find out that without certain name into a parent measure—or interest it process outhit (stayling est), but the three cheshes who have just behind it my they don't moved either to live the the process of manufacture to suprage or to make it Soods you might have those treatiles, or some of them, and they removed beckwards that these feeds overtained ultracies. Now one of the four or five known witnesses has been related by the Colombia University of growing years there is only one part of Vitancia D. Burghis vitamin is the one which stimulates growth lets boye to be able to show some day that and it is the lock of it in the human dietary walch p

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Meteorites

I attenty to be altest cretain that meteories exone the brack of study creats. The very na particles that trail along after the heads of lang exteris, conditating in part the talk of them, on both the sit, produce the photocrass of "shoring state," arrend of which sayone may see cross the harrons on above sity clear hight. This meteoric material is almost one clear night. This meteode material is known to be investing at very high schooling-sense of hates as high as 26 ratios pe

ligh as 45 talles per weath New colculation develops that 20.16 select per sec-ent is the "paraladic telecty" for colouled nighters to nor soler soutes, that is, it is the maximum velocity then a both folling torounds our out can attain by the disneter of the curit's orbit, even though it may have been fulling free the placed confers of space other words, a half say have been fulling town our our free or far away that it has been fulling furery, yet tide is a relating that, at the distance of the carris from the sea, it captus exceed. Noting this ned between the name relation of auto and certain courts automorary ware formaris proved to lead upon all seriouslies and courts as only itselfy extensives to the waar system, haring been attracted late it from very resorte division. November in the property of the property of insectionists tools on courts for the last 22 years, serue to have refused this old blen that courts (234 from Startedist space," by proving that these with elibelest orbite have abenys ferrord a part of our

tirunting the stools, then, that meteorites counts) have always formed part of our solar ender consent table situages fermed part of our solar system, what has seen their hiddery within that sweeten? A partial snewer to this question he to be found by a study of the structure of set-order. It is quite over that from such which that they have not always been cold bedies first through over sper, but made at one time been maken and subsequently cooled under creat presents. This is extinented in their course crys-taline structure and their ceripded game. Even OU. in a liquid condition in minute cavities has been fracti-in more of them. Such facts can be according for only on the theory that restourities (and nametal formed the interiors of large planetary belies or of a

milet mystera.

Now all these facts harmoniae well with the Cha berin-Hopkin theey that our power wher system is decard out of the week through "tital disaption" of a ferner solar system, the disrupting agent being another and much larger outs, in proximity which our femore solar system at one three case. In accordance with this theory nationales are frequents of this focuse solar system phase and of this focuse solar system phase section and of which our present solar system is still being halft,... itseed from the Scientist Monthly, Nov., 1923, ortion by Profrage A. M. Miller



the precise of materialists to capture or to make I for raise theraselves. It is but, in short, an end in lively but more of a membe to an end.

but more of a menta to at one.
That and is, is a grapest wave, the energies knowledge of finds and how life is supported. The plant

Not a textile product—merely sheets of broad from Arabia. In life it looks were like parehment than anything olar

life to strepty a cheated process. They do think, and past experience supports these, that mark a piece of knowledge as that gained by beliefee. Titselfe II is portly sure to be useful in more ware than notice of There is little waste in the output of wistiff inveloping. Senitals price lecontrol intersection prized term up werk it all were of fingle ways, Batting meaning on this and they was by to do un much for the over. Then with that as a lover they will now of name knowledge about matter.

That is the way advances are under in the world of few years ago glodesty of dools were enthrosed

> ged some people who were found to living grow tired of 2: One six et level extina and who let life appetite it steed on that some of the role ony return Name accordanced to take a second "olg," as 2 ever, of ted plats ford by tweet uses that select we But here it come out that they had been lighter las there's withouthing it is now known. that the provides which poper-searily these stick go on in the elegath; and that yes might ent exactly except cal-

-Curi b, they weighted

part their floor and approxi-parted a perfect daily grave of relation. They also talked a great that about cul-ele

The British Empire Exhibition-II

The Colonial Buildings and Exhibits for India, Australia, Canada and New Zealand By J. B. C. Kershase

TIPLE AND August) the Wentley Park the British Krapire Ka Nition were illustrated described. In this serarticle the buildings have been erected to

m. which is to be held during the first floridght in July. A full recort of

conference will appear in

remeas Directal case and des will be dealt with : d metas por lindnery provring Sij acres

The profitor which has been exected by the General tire arresponent of these exhibits. The exhibit of mineral execute timily every rendering wise in the II

erre three acres of ground, and rependuces some of a artistic because of the forumer Taj thi at Agra, and of the Janu Mosfid at lit. The parities is constructed of steel and threes placer, and is finited by two adjusted 130 feet high. An ining white done river above the main every; and in front of the main parties maken county or is relief by an a columnia. The artistic affect obopen relatings. The artistic effect si-tained by this from of construction is-considerable, and the Indian purifies reaks with the Barmone as the most striking of the whole exhibition. The

work, curpets, curtains, curving in of and twey, and all the other misone arte for which Indian crafts es esjey a week-wide repainties, are splayed in this pecilion. other interesting establishes the disane and medels showing the activity a planer the relater of trude nurried on Calcutta, Bouday and Karmetis, and w the franceset problems of the East a solved. Indian theler spel its uses. me the ephyert of another particularly

he entired of memory parties of the In-re display, expended by the In-memory. Many of the a Faresty Department in release injurity taken space and show the raried resources of finds own States In a scale never attempted before. Models ere also exhibited, showing the furney

De the estated, along one moves
(Diper Face, out the other parts of the folian frentier,
where before computes have been meried in in the in the freezy section. Heritaintee in represented by
sect. As Indian includes not increase have been a maried douby of both fresh and preverted furths
monitoried moves the trees on the term hade of the which are not up it a typical Classician section. elber and on fining these committee the attense of this way laterne ing section of the entitle

We regret that the ed in crowding get the very lateresting place the of this building and exhibits bessed therein The Constitut realities forms an imposing helid-ing in the Neo-Green stale. on the sorth side of the lare of Engineering were about the ratio area as the Indian pavillos, and was excited at a coat of er a militon define-Mere a correlete conce of the Intural und. etured products of Cusade la shore Arriveltum exhibits to surely form one



to and namenous of Canada

la a large non-

The \$400,000 edifice that emph

are the s

Australian has to offer, both to the tourist a respective motter and capitalist.

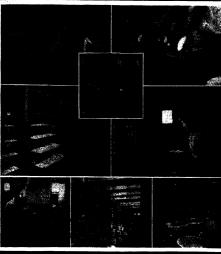
extine settlers and capitable.

Thisters of Engineering and Industry, the Philame of Engineering and Industry, the Philame of Engineering and Industry, the control of the Engineering and Engineering and Engineering and Engineering and Control of the Engineering Control of the Engineering Control of Engineering Control o Merine sheep are exhibited alive in grounds, and there are periodic at erwands, and there are perholic theoriestics, dispays in the perilism. The principal metition of the principal metitions are devoted to the products of pasticel bidseries, delaying and fruit-proving, and the Assignation and train-proving and the Assignation of the Assignation of the perilipse and transportation, are also well represented by uttractive exhibits. A citema theatre equation of metiting 500 people will take be fewered in this building; and in Illia.

Size Mustrating the life and Indi A large cold storage in another to A large cost morage in another sensor of the parities, and here Australian re frigerated products, butter, meet, eggs responses products, notice, ment, and prolity, are above. The Cos wealth Sank of Australia have ope branch and stracked to this is a re

roces, in which Australian & ore relating to the country can be re hid out with Audrelian plants and trees; strong

The pavilies of N
Zeshort fluxes the lake
the west of the Aperral





FROM RAW COTTON AND SILVER BULLION TO TOUR SNAPSHOT: PROTOGRAPBIC FILM IN THE MAKING

Speeding Up the Sluggish Cables

Wired Wireless and a Re-Designed Morse Alphabet for Submarine Cable Communication

By S. R. Winners

RAPPLICATION of time ratio or "wired then by retractive rathr has been expect ly undertaken by the Signal Perse of the War Prontment on a cabling apoless from Senttle, Week, to Ketchikak. This has use of realls was dischood in an na. This pro me of rects was disclosed in all less by Major General George O. Squier, former of Nignal Office of the United States Attay, at the al meeting of the National Academy of Sciences. Washington, D. C.

Experiments outdoored during the last 12 out illum M. Brace. In, cable engineer of Springfield in, have resulted in the development of a new type of orde alphabet and a tremeditor for sending cited Notes alphabet he cable, land-line, or radio The secure tale, the heart of radio beneficiating neapiroresty in repension cubing by ratio when affection of the cable signals will be obtained in this regarder. Mercover, this departure in applying

is said to increase the speed of innocessions and incu-inalities weight in cabing. The reministrators proposal which Got advances for soulfying the More telegraph alphabet, belefy explained, is as follows: The sending of the telegraphic code is, by this new spores, effected by verying the intensity of the three elemental signals hashed of the transcalesion of deta, dashes, and spore, ertical at accept. Mureuner, this per similabet one to hande the moved later-andle range of tes, which would add a useful lead of wave athe which are at arrest untilitied became the

in the range of the human ear. The first problem in relating this code seasons to cabling was the drovingment of a transmitter capable atirally waring this ratio type of alphabet This has been accordished, and the device is shoul the accompanying Hipstrations, In fact, the only meany change in the type of cable transmitter in one for years was to provide a succlustess by which ry new used in sending square-temporal waves of the Moreo signalet eated by adjusted to the framentation of the date, duries, and spayer in carying amplitudes That is to say the cuie is reduced to a common time at and the dies, dashes and stages are distinrational by verying the intensity of the signaling e mechanism added to the ordinary calds has brooken to many over electrical prel-tageen at

value in order to provide a size-wave type of elect today force, which chappe the appelliple of the deter true predices a complete sprin, and the disk, four lackes in diagrates, is monthly vertically. The shaft of the mater which drives the time carries two lemmes which retain with the shaft and century with the way made. This testing for between Indiana the management of the transmitting tare and the lastery



mi-days of the alte rest is index easted by the two addustable she

now, presently referred to receive belief, according to the impenses of this per uph alphabet, the operator does not have to learn rings in colling. The phengruph indicates that the transmitter used in tax only concret to cable or this but also to a felegraph true



for radio and hand-line circuits. The change, in one to meet the needs of the needlifed Moree alphabet. space radio means the use of certain resimmen by mounts of which the dec. finds and once centuris at the transcitting tope will give different availabiling fre-quencies increal of a variation in the amplitude of the erior frequency. In space make, the investors admit

this change of amplitude would not operate authors terily day to follog. ten, for coditary radio raph the either, redi graph signals may be real deformed to depr reporter, reset cable operation compared to a pa

tirst who has been does for many years and naw requires a major operation. to elect likes on the tred to experty receivery," [8787-experty receive Major Gen-eral Syster, "This operation markets in redesigning the ablished Shelf according to the inner registering pracgreen tenber that the preent Moree alphabet trate-N and R. with a stage for

nt. On the other hand, the five let L.M. O. and B. are sent with double the frequency of the group of letters previously referred to. This, according to the former Chief Highal Officer of the United States Array, the speed of the entire traffic of comp to have been blocked by five letters and by reasons as used brooms by the nightelet family.

The new olphabet, where speed is a peculiar virtar, twisten the use of a very as to

impress upon the cuttor a continuous modifiated wave of valsings or electric current of a definite fundamental frequency and wave length. This wave is modifiated at the new place of the resultant current flowing the the circuit. This varies the amplitude of the indi-viduals half-cycles in three stages, representing 600. dission, and spaces, the elemental units common to the international Europe belarrank code. The relative values if these changes are under the central of the each erator and may be adjusted to next the needs of the cable used. In the case of the cable, 5x incisace, the desired condition is when the three angli-rates are of equal value. This resches itself into the tive of power transmission by alternating car ation of power transmission by alternating cut-Thus, the speed of sending of the equal signal-tiplied many times. That is to say, the speed is multiplied mury times. That is so may, the speci-is all that could be desired without regard for the freicy, the veltage, or the length of the cable. when the modified Morse nighabet is contactive. Th

nedern Ainjdin issue which terr broots weak sign. in your reception of broadrast music and speech, will be seculated in speedifying simple suits array the previous offencies to use the vacuum cale in amplifying nais received over an occum rable have not beet results! Major General Nobler mays "In the key dental record over at come risk have at the same of th

the cable is discuttered from the lettery at both end at least six bottes a day. This section waste of that necessary to drain the cubic of excess also see in order that the consumination system

change in order true the consumerations assess will fraction the sensitiating 16 heres of the 24. All of which prompts Mojor General figure to re-marks: "After own half a contary of experience with secont college, during which these every redocutes has been introduced that skill and impossity our devices



echanics of the new Squier alphabet, showing the transmittle the successive steps in the transmission and reception

Comera to Photograph Cylindrical Surfac THE Recess of Standards has for a master of years been catrying on tests on the currentum of buried Apper. Shart ingaths of pipe, with and without pre-terior costings, have been hunted in various kinds of spile in different parts of the country and due to other a time to determine the extent to which they had

to an old to repositive the artest of on has an use to recovering the second of common of these spectroms, Mr. II. Davis, the head of the pho-tographic laboratory, has constructed a consent which photographs at one operation the entire surface of the play. The firm is moved past a silt in which an image pipe. The firm is invited just in still in black an image of the pipe is formed, being driven by an electric vector. The firm driving from its exponential in a hely to the shaft on which the pipe revolves and the cumto se arranged that the forning of the plus council to to an arranged that the toroning of the pipe consed in-busings to introd with the same opened on the filts and in the same direction. An automatic settler steps the system and closes the absorbe after pipe inco made in little more that one complete revolution. The shatter is always upon while the motor in expense. In our abotograph, the driving motor is on top, and the pipe on the right to front of the iess.

Home of James Watt Purchased HEATHFIELD HALL Bryinghon, the home of

James Watt, with surrounding arounds has been experied by a syndicate who intend to develop the centre for the execute of private residences. Watt placed the strubberies and gardens, and many of the trees were planted by Mss. The garren was filted uptree were planted by tells. And garren was already as a workshop, and there the ground engineer continu-tion mechanical studies and experiments for many years after his retirement. The

nuts remains in the precise condition in which it was left by Watt.

Searing Ice by Machine CE-DELIVERY, under the ++1-fuels tectation, is not a very precise or custorous business. There is always establicanty business. core or less hapkassed guess-work on the part of the turner, sacet senger or may recipit, and loss of thus in the estimating, hazdilag and ratting of the lee from the wages. An escape from this state of affales in now offered by an irrescential machine, which makes it impossible for arong weight to be given, save by blander and which results in great increase of the erritory evered by one driver. The capacity of this reachine is from The connectity of this countries in their likens per referete. The bright is 5% free, its wints 31 inches und its irrepts 23 free It takes the large blocks of lor on edge, worse them lengthwise, heads then up. score their crossesses, and discharges their stunding on end. The operation resale in a served harder along the edge of

sain it is sovered invester using the experts such piece of too, and talls border in the customer's guarantee that he be petiting full weight. In we weren't used be not later that 25° and 10° result alone and mare he cut along the several litters. The randou subdivision, by the driver, of a 200- or 100-regard cake into pieces which he hopes no of 30 or 50 parada, by the chopping notified, is similared. By no means the least advantage in the greater pendbelivering to cook house at the same hour each day.

rish out be taken cure? of with word and offrietre if er fee is muchin

emical Analysis by X-Ray Spectra N a paper real before the Temberon Batters-Gentle what, he D. Noter stews that the eviations between the Xous meetrs of the Offices rivately are as simple that, it were respected they are three

sale freperis, they are taken useful for purposes of classi-lest enalysis than ordinary luminous spectra. An its period ofvintuar is the fact that the X-ray specimen of an rispent is quite independent of the instance of the enequals ulug it. It is ever detect the presence in a min ture of which me mee that on up, is multiple. Certain presuntion are neces in examining the X-my spectra, sittinged the mu-



Anchor, rape and cockacrew stakes which the American aviators carried around the world with them, to immer keeping the plane in place on the ground in the highest winds

South. The albettors over tested before the start for bold ing on morned samply between of hops, and they were not of thee for each element is example the Indied, resupposed to drug except during a gale. Early in the cent observations have shown the existence of a next her of wester line; in addition to this, with the high world flight, however, a lowery wind expect one of the aleplanes to drug salebre in the boy at Riks. Alaska ner or wester inter; in position to little, with the train voltages new generally used, test only the apectrum of the first order, but also those of littler orders appear but no descape resulted as a meriatric was in the ship when the wind strack and he started the caster and tanked to the shore. The appliers carried with these similates have 125 feet of rope, and in water deeper than this they are of fittle

Imperities in the sectorial of the

Camera for photographing crimérical surfaces

and in the substance under examination, site give their lines, so that three are often various possibilities to be considered before a given line can be explained. Not only the wave length, but also the topical appearance of the expected fine paper be excised at a well as or me weapered man maps to receive 20 wer me their relative intensity. By necessing photogratically the intensity of the spectral line. It is mostly, in went es, to obtain a que

of an elevant remove in a substance

Machine for secring ice in 16- and 16-pound at

nding Gear for the Round-the-World Planes ent ambien of heiding en Talepiere is piece upon the rents to other so prest at breeder it in the old. To nest tide different attributes carry springs and those that had use the ground corry over both lead and was an irea sirpless fring around the world, but anchors stell stakes are carried Seedel cartistarat var stored about the route of signed to nevt str sedit

modes. This included spriege, mode, jerks, citi

value except as a drag.
For me upon the land the world-craising airphose found exchange states which may be twisted into the ground like an sease, highly useful. The made handle whilet is detectable may also be used as a lever to sever the stakes into the gr All madeth extenses in realthy here Stable that nevertible prepting a plane until de a langue at hight carry states and rope to held the strylane down. When a wind cause up, an strylane is costly overtimed or blown unuy, and strong stakes are needed. The strokers on the world fight Second. The strytches on the world Right can lift cove 9000 pounds when pounded through the air of 80 miles on hour, and if a wind of this speed should blow, the chiller plane would be lifted into the air sties it servatakel dans properly. Oter about 6000 pounds and in an 80-atle gale an upward simile of 3000 pounds would an upward winds of 2000 periods would be carried upon the states. Experience has length that the best way to turn an alignous for staking is 45 degrees into the wind. In this way the fifting surfaces

are least effective; the to the single at which the wind office. Notice are driven beneath the wing tip of all late model attributes have share size the stake repea, but in titing down the year, the repe is passed around the would pure of the furniage had in set of the tail earliese and then teads very fast to

is stakes.

A jiek and the loans are also very becoming equipon well as all others will spetal as reach time on the greened as in the sir, and besides, the greatest strain of an alphase is when it is brought into restact with the ground for handing. To blow our a the on leading is a very cornect archivel, and frequently three are bloom out with a load power, while on airclane is in . This is netally der to serkien exputation of the air within the tire, and this expression results from the urities of Saray latery of our that simpletes encounter

When flying through Asia, the around-tiatlaters corried two extra tires beneath the fuering of their elements to next such encrements assertened for the last winds from the Indian jungles will spirit expensive of inflated there as will the burning sends of the Presint Sweets. Altriages can usually mile skill it plicing in order to preven one wing from eligibin the pround. A hard landing blowfrom rigging this the ground. A hard landing bloos-some three than suptima else, Ashtate, and this "streeting a tire." The quadro will be used on the world flight when the simpleme per stock in the area, which they will probably do not a free consulers in lastic and Turkey where modify fields will no despit be

NSIDERING how retainedy short a time commonwealth have reasoned market in the the extraority have been in use as a ser-th-wald instrument of formal warfare, the rapidity of its development is automisting. raidity of its development is interesting.
The test justice schemeter, "Holland No.
1," non-high-led on Nov. 2, 1901. She
and 120 layer when subcorrect. Thronly jourer, to the very day, the first of another Buttleb milhave, to the very day, the first of another pustion sup-marine was hid at Chathum declerard, and this vessel. Ryong see "X I," began her trials more months ago.

When it be mentioned that her returned displace ment is just 30 thors as were use thest of "Helicant

admiralty Not. "Particulars of British War Ves-min," "X.1" her a file-

placement of 2700 tons on

\$600 tups when size is be low water. For the tretherefore, she he the latered referenceshing craft is calcioner Nest

in select of size overs the

last year, displaying 2140

(7) tells imper-If, houseur, rglmerged tomange by taken as the criteries, "K

No 1. gained of the electrons attitue opini aspanist design has track in two According to the official

nume bles will be

knew, the problem of stability in for more complex in the case of colors-radius than in surface sides. In the latter, every stillrian to the weight, curvied together tony he commented for an increase to adopt in railed rer" stability-digit in he increments the beam of the side to respection to its death. For since form has no effect of the stability of substantiars when they are below the surface, this expedient is of no avail other applied to such vassels. As Mr. Marley F. Hey ex-pressed it in his admirable popular treating on sub-

extensions, as long up- as 1916, had tackled statistions problem with a fair recourse of sacre through perhaps not do the same little as their Genry

cruber of Toll time surface displantant, with a leng of this feet and thicks bear. The deck, the pions at of 465 feet and 46-feet beam. The deet, me spon sans the examinpower, in fact the violes part of the venue which is exposed when she is traveling on the extraor-aire planed with fee-tach arms, representing a tota wight of 415 true. He arms arms and consists of two 5-block grass, each of two 5-block grass, each

reserved in an are revolving turner on deck.

These gaze, if of 50 cell-bers, would weigh 15th tons spice without their number, and could throw 275-pound shalls up to a muximum range of plant 17,000 yerds. Five are provided for bic cus. There are such hig pan. There are such hig pan. There are also four 3-tack 90-culter gams, fring 21-pound shell. Four topped-tubes of a cultier and ared are freed in the bow and fuse in the steen

low and four in the store, with two more these of deck, having a wide age of training. Providen is made for excepting 45 tempoten. The result is proposed in the surface by these sets of Direct by these sets of Direct

engites developing 20,000 histo through triple shaffs, gitting for a speed of 22 or Table, through trajor matter, greate not a speed of 32 or 23 km/s. Her electromates for entherapsi craising develop 5000 knowpower. Rafficient off-fuel is stored for a continuous veyage of 25/000 are siller at an economical speed of 11 to 12 km/ss. A crew of 100 evaluation special of 11 to 12 kinds. A crew of 100 offeren and now lic respirated to work the round, which can subscorpe in one relation. The second droign in for a subschaping submarine of identical thousandous and augito preser, but compling, instead of guas and for-

in, the great load of to less than 1000 solone. In view of the decided severed treat in the nage of post-war sub-marines, these porticulars have measthing more than a merely academic interest. The Siritish burni authori

> their research for building supply to have been designed to the first place for recompanying the buttle Submersible destroyer ready at the proper a pedore; and, seconly, for

secure, but thanks to be secure and the secure of the secure of sugines she will have a moch wider radius.

But arranged it understood to be light in the facilities of secure of secure of the secure. Consisting it secure portion to the displacement, constaining of mod-culture reside free gate and a number of topologic to its the early days of its development the obtain-way reparted constituity as a talk for court fell and was not helieved to have any value for de-questions. For times have so far changed that (Continued on page 227)

lesigner of German U-beats during one is covered with 5-inch armor. four 1.4-inch gum, and 10 torped martise single, the only statistic a best presence when it is investing submerged "is derived from the fact that, as in a pendature, the enter of weight is below the center of augustolon."

Noverthelm, without its any war integrable the

originally of Problem Planes's flavorry, it describe to be noted that feedigt Godgreen were able, during the war, to baild theroughly safe and reliable epitenations

which meried much leavier travelights than the Gen uan Ucralers that proved so deficient in sta

teres," an ex-through best time serving in the French Navy, which displayes 1900 turn along and 2000 turn below water. The largest United States subscribes actually hability are the "V-1" to "V-3," officially staned to display 200 test on the verfeet, but renor speaks of the three "cuber-subsantiars," Related in the new shiphalling progress as weeds of 200 term. France has the decided to held releases like of 3000 hass, two of which are to be held down this won or next

It is prodict that the form pring types, pipattle as they seem in recognition with the curiest books, model by entirely by the intest "Fateroon Kregger" of the therman of the through Navy, Professor time.id. Planes, one of the above of General moval architerts, who test is proud nett part in the construc-tion of the wastesse "U-heat" fieldly, recently the typical designs which he need of all problems in next workers—the post-lors of stabilizing the sale marks." Ex-tte" Early in the found that it subscribes

endored with percentive

er, how name was, or

The steam-driven British sub marine "K. 26." Length, 340 fe

even an extra supply of terpoles, their stabilitie suf-fered innestately. "The large substations we built fered insectionly. "The large extensions we half toward the end of the war often, in volumenting, took a life to port or startened of so much as 25 degrees. which naturally played have all the person of the open and emetions led to disorter. The nature of is new formers for stabiliting submotion without the aid of hallest or gyrodate by five not reveal. As of who age funditive with the redirectly of the applied

of 2018 mes, which curried may his back grow, the reflection unight of these woman, with their needs, being since 20 tons, On the other head, the Brillet estimation "M. 1," built at the same period and dis-photogratly 1800 tens, comies one 12-inch gas. The "N. 1," unlike "U. 142," in said to have showed to ladi of schooling, and has proved quite safe and seriely in service. These facts indicate that British

nik's Pe NS of the most interesting angles of the fight waged in Celifornia by county, Scale, and Federa s against the feet-and-earth epinosis,

Not only were Department of Agricultural officials. mitteni constituinora, sad veterizory european weed late service, but contractors, carmenters, chem a and engineers were entitiered in an effort to stance cat the disease in infected areas and prevent its spread into aniadated perfect,

For exchange, longe trenches had to be dog in which to have themsends of articular which were alone by authorities after they contracted the maledy, dipping was had to be built though which all outsurdibes bearing quaranties territory were forced to run, and distributed come of reliberies and enterin but to be used distinction over all relief of same six is to be used for human is entering counties in the district certain, and is the gengaration of all districtions that make the properties of all districtions and The display when the rationalists, provided to county likes, were to fit to a consumable may which them a district to a first track. Into them was a solving of hidderich of secrecy of a ratio of short to 10 to 10

in one case or the curying frenches the saughtered stock, Means sharels were employed to dig monthless in feet deep, 20 feet wide, and in more cases 900 feet into. Into these irraches the infected cutifs at other stock were driven, shot feeth, overed with mixikine, and baried, thus effectively preventing any further spread

of disease by the indicated hards



The micro pe that upon the rex or a sec sting conditions. For example, a stirll of 14 per cent accounts has been although by the use of extended to the making of which 2 per out of promoters sincetaries in making of which 2 per out of promoters sincetaries used as a presenter. Setter presenters will give greater yield of manuals and ease a beauty plots, but the former have not been practically developed as it is believed that they on not be ultilized accommodity.

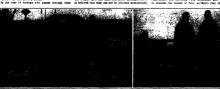
by Dr. N. A. Odb. springhten) probabilists of the United States Department of Agriculture, so effect alterior to the new of a spot light in a dark rose is spleyed with the telen menter in the search for objects to This officerest was made In a mide field of stelen tile telding advantage of lacts since in the fermation of the house of the sun on the tissues midde of the in attempting to displicate the effect of the seat's perking

through a hear placement blost, glove-nation larger contribution service, factors of samueline chartle, and water conclude with, were each used, in turn. The results were not extinctly rates factory in these includes. However, a large when of gion faels ended with indrofuence wild produced emilifeliar needle. Deeply colored place, green or blue. By stingers) to this purpose

The elect of given is placed between the san and the director radioner, the conditation revealing space me otherwise made visible. It was found that the sub-stage explotive gave a very small leases of the some of light, while a suitable producer is an exmedingly high-power microscopic objective. The are light, when an enspired, in interesting the sun

Inverted Flight in Airple

A PAPER: of renderable interest to practical artsimilate fight, was read revenity before the Boys Architectical Society (British) by E. M. IIIII. To paper to collide "The Menericus of laverned Fight and is based upon extendive experimental flights chemical by Mr. Mill and others. The object of the experiments was threefold. The insteading all was to examine the current of fails arciferin that other



afast neve teasing from county to recent. Blaff: Long et wape sed in the Ostefation of th elicking of people passing from Inducted to diesa some Putting people and corresponds through the mill to hours against the transportation of the foot-and-mouth epidemic

cities reaching from threat to achies were used and under them formaticityde gas was penerated for five minutes. In more counties passengers of anti-mobiles and stages were freeed to wade through the distribution

and stages were forced to make through the districtions will be seen. Size countries used -remove desistants of make the second stage of the second stage of the second stage of the stage

New Ammonia Catalyst New Ammonia Calalyst
AND ammonia culture has been for
A religion by the dass divingue research
of religion by the dass divingue research
of the Department of Agriculture valids
brings about the permanent makes preportation of assessing seconding to the
particular permanent mad in the entaryst.
The letter is described as a resistant
product of the man after constanting premonent. The premanent are also described
to the control of the

will give ony bind of or

Making the Sun Help the Microscop ME image of the sun sury new he need as an aid To the microscope in clarifying observe objects. Sensition, in the making of microscopic observations the britisher of "Did Sel" has been too prest for yet by the taked eye, and to that event hindered rail than helped in the magnifying of olders. the to a startle piece of could

Digelag a trends for the filement of the annuaus of infected with shouldered by sometimes artics. This trends is its fact with, I fine does not ten feet long; it will accomplishe till Sanitary engineering on a gight scale

niming swearer as inverted position and the pilet fully to right the markine. Rabeldery also were to that the negritudes of the leads in inversel first, and examine the beherby in inverted flight of purples with different stability characteristics An acrount in given of the ways in which invested flight can be obtained, namely, by seems of the half loop and the held rell, and detalls of the margrees are

gives for particular simplenes. Belt armagnastic say of express inc oner, reservally to unstable fighting titler, especially in unstable lighting ma-chines; pilots often full to use the con-trols because they cutnet reach them. Streety invested Highs in possible on all types of muchines investigated; but whereas the heighted halfy market markets needs to right limit, the longiteditalis ametable machine has no each self-rightie apparation: there is, however, no real diulty in recovering from the inverted rhine It also liable to get lote an inverted spin, her here again the pilet our receives his bulgare. Mr. Hill suggests that "the best convenience became sofers and rewe transcrive shifty he to be found in on alreade which though perfectly stable throughout the maker part of lie range of fighty specific with elecators from most definitely by stable with them

The Story of Steel-VIII

From the Ingot to the Finished Product-Rolling Steel Rails

settled the successor processes by which also b produced from lost one. We have rect that the stone agont at the produc-tion of stoot is fire first by the extrine-tion of rote under lot air liber in the Most furnise to another six lies, and then in the fieter heat of the comprise and the open-bearth furnary to

will deal with the water

factors of the steel laged

as the is the principal agest to the production of

the laget so we shall see

that the steel rule of the ralling mill, assisted by

furner but, six the prinched some to shaping the steel ingut late the retails tedbook fickled forms of the evel initialry. It may safely be said that every rate of m, at

some than it our roughful

days, has watched the cost

take a hump of dough and rell 2 days to the desired share with her reltine win.

over that the eithe agent in the arresppetter the nig hou to steel, which is east its the form of an inget of from two to feer tone in neight The succeding chapters

intrincal element throughout the rail; and, necessor, there is an in-sident action known as creeping, in which the rail, because of its monothic debrauches under the had, is replied and drawn forward spring the heiding had, is pushed and discent forward against the encount provine of the splitter and unif-coupling right. There is also to be added the intend stormary due to the side blows of the trait, particularly when that confers history swyling moths, known as "works," sets upin which a papelite inventebre, weighting frequency

to so every relitions of people transported.

In the early days of railread kisters, and up to some to or 20 years ups, tully were relied from Breat steel and the reflereds called for a steel entrying about 11.00 per cost of curbes. High curbest means hardened and redefence to wear, but it curries with it a brittle fractions, so halls give heater, began to occur with signaling frequency. As

even more prolific cause of lounkness was brittlebon dur to the phosphe the Besserer steel, which ss 0.10 per rett, Phosphorus, herceter, cames to ribulented to the converter and in survey to the de trend of the militards, sin In their desire to replace in their destre to produce a reliable roll, the mans facturers began to turn in the open-hearth process, in which the phospherus can beer can be also shaded. Thereby they were side to get rid of the fungreous brittleness of the

Peneruer rull; for, the to or less per cent, they wan able to increase the carbo content and produce a rul that was at once though sea electic, and thereto and with enthrient be

e in the head to stand up to his work don reseasely long life of weeks A medern hundred-pound rail, th about \$20 per cent of alliest, from \$400 to 0.25 per cen about 0.25 per cent or stores, from over or out per of curion, silver 0.045 per cent of sutter and a high custom of from 0.76 to 0.06 per cent of anaponess, this emetrished pounting and to the houry streeties of toe electer. If it be used with moderation, meeting to

give a land steel without any exponentiant tendency to brittletten. Manganer uler serves to give the very de drable element of tough We have seen in the prethe atrel is Getero

coding chapters that the during its treatment in the furname or the electric for nerv, and that the question of its composition is an all-important one.

Now the cust-steel ingot might be called the raw successed of the radi mili and it will be understood that all the desired chem ready is the flaget. rell mills make no change in the rheules? compositi and they are concerments with shaping American pattern known as the Teroit, with a heavy

slight vertical web and a broad, far, rapering base that it should be based that, although the rolling produces no chemica change, it does n ad physical changes, for the cost to marane pervices country, per the cast mage to siline in structure and therefore, population con look and treatile and boulets) attenuels, and the

alling to overtarn it. And finally there are the ser-

spragg and creates a series of the constraint

the abtining wheels and the returning effect when the jetters are applied. In a word, the reside is all the

on of which the steel authorizer analis himwhite-hot land to the de ed sign and slaupe—with this important difference, several handred fetts, swape from side to side, deliver-ing least lateral throats against the head of the real.

that is the relies of its the work is done between two stationary relating rolls, drives by percental strum The speared chapter deals with the routefact steel raits; and requesting the rait let it have be said that, in the board field of the steel industry, there is probably no whate material that is called upon to perform

as the steel rail. It is subjected to every convelvable kind of stress, and proare beautily flytamic in character. In the first character II the root timile a metterson rinker short 22 medic the two. The loads which case spen it are leavily encontrated: they are inwhere of incomming or train four tyen the nell. There leads, moreover, ex-If the track is not also The worked point in the streigh of truck comes, of ergoe, at the call felals, where in allered is made to restrict the glader chareful a puls of the

against the statting costs mer to the complete com-

slotely to restore the

time endousering to crash the rail by congression, to test it needed by topolog, and to train it out of algori

strength at this point, and attody tend is, the strength of the bint in mount atrly retreet, it was under the lead and early wheel, as it thunders by drops into a better and strikes a twitte blow against the end of the second

To need all the above attacks, therefore, arrange of present over.

If it is by present over.

If the by the box off, for the experience and contraction of the new form of the new force relative to the box of the new force relative to the box of the new force relative of the new force relative to the new force the new forc

the service of the service rolling increases the density of the service and increases the density of the service rolling increases the density. the rolling increase the dentity and top

SCIENTIFIC AMERICAN

other building containing the of mili, which is 1800 foot long by i feet wide. So far as we know, this is no entre electrically-fitting mill which the stily electrically-driven and which rolls raths direct from the input without releasing. The roll trains are driven by 600-only induction scores, fairce of 0000 hy, and three at 2000 hy. The rolls and traveling tables on ten of centimerely down the whole 1000-foot length of the building. At the unpure ent to white hat to other the first set of mile and after 18 meccanive passes energe at the other end in Distinct with, The retaining process in continuous, night and flay, and to estand on the observation platform and worth the nighty operations in one of the sensa-tions of our present-day, bintay some-tions in columnial world. In every 24

brees this mill can turn out 4000 tree of finished 100-posted rule. At the Gury mill the inget moids are care fractioned cars, four to cach car. After the steal metal has cooled to the point of soliditioning the moids are lifted off by an everteed steel crute, and then each taget is picked up and lowered into a sweining pit. This is a comparatively small factors with a continue, allow-brick-lined cover, which is beated by huming gas. Here the lagest regules for an loan and a half, more or less, according to the quality of the steel, and in these gifts the weekness will sell you that the legate "we"that is to we want to the property of that the agent we'that is to way, they become of uniform importation
throughout, so that there is no soft cure of partly
wouldfield metal at the critice. The assisting plus all
Gury our table four logots per soit. In these, the Gury out take four impris per pit. In these, the traperature of the ingets is ruled to the desired point for reling. When an inget is really, the cover is rereed, an arm from the overhead crupe nearlies dumn and with its steel fingers grips the inget, lifts it out and with its steel integers grips the light, little it set and sets it on a religing table, which consists of naturing noise set one beyond the other in the direction of the first four sets of larget rolls, in which the four-loss inget is reduced to a "Nicou." 14% inches by 11% larget, by 12 first long. It thus sowes on to the slove-

high blooming salls, which constat of three rolls, such should be include in the sector, placed vertically use show the other and ivergaled at each end in manifer unright etapolards. The irent nil nates unter clerkwise, the middle roll clockwise, and the beganner mill expanse The vertical space between the rolls is regulated by regaring screens set in the top of the housing

Loading the finished rails by means of overhead electric craze, which is here above lifting twenty-one rails at one time

because the middle and the top roll, the input being formal over though \$6 decrees by receip of learn notice, and then cross back with a reach between the middle and upper rolls. It is needed at a tobi-which he lemmed and senie the mass through for it-third peat, the bloom strudby greating smaller in secthat goth the states because you provide the length. There, the sand becausing proportionsisty in length. There is less that that it takes to trill it, the black has so below that purpose and it is bur on-operation of its original section and proportionable league. Next, it raises don't the self-unit section and proportionable section. Next, it raises don't the self-unit section and proportionable section and proportionable section. dent the will as repay exercis nears or our means which est of its reigh ends, retaining importise and also what there may be of any original "bire. one wast there that he or any improve pass on to the

fret of the "respirat" rolls littlerte the Nille leave less true cylinde now at the apprendix mile have deep greates which to each property set of train commenced pure and mere to the shape of the finished rails. Three purses are made through the first "reaching" rels. a single pass through the second "roughing" rolls, and and rell, by which time the there are four passes through the initiality role during

see its perfect finished shape the last finishing roll the roll, insiduc for all the world like a huge red make, recess to rest be three circular area, which are set at the tances corresponding to the 88-feet length the full plus even in-ter allored for empreyties during couling Not only then the least in the rail after the length but it therees it was of the

175

longinedizally, and if provides now not nucle to regation of this it would be bedly curred in its legal when it cooled down. The latter tendency is consistently by chine, which bends it so that it is convex on to his unser face. The roll is then on to his upper face. The rail is then carried down a relier table and drawn laterally on to what is known as the cooling led, where it cook down and the consector discovers leaving the rail ap-

restmently straight.

Note that to then conveyed to got the convey the any rows the rull is reared true two supports which me from 40 to 60 inches uport, and say part of the rall that declairs from the straight is hid upon these enterests and a stanger comes dones centrally between them to do the straigh A skilled workshap deteriolers the amount to

able the rall is to be lett, by ploring between the plunger head and the rail o first pageing tree, which is elightly toyered. This straightening is done on all four slightly inspected. This stringshorting is done on an own-sides of the roll. After this the rulls are facilised off by rhipping or granding to reason born and the name onto are reasonted by fifting. Then the rulls go to the defiliting monthly, where there have not diffield at each ed for the inerties of the splicebolt

It should be mentioned here that during the rolling of the rolls at the Gary shape there are no less the seem seem sentiate inspections, after the last of which the are haded at the stock piles. From stock they as tiend crates; weighed; and si German Chemists Study Boll Weevil Con

THE Great the certal is showing great activity in connection with the winds of bell worstl control Segar gars of the option that this individual florum chargers think they been made a discover that can be applied in bell wavell control. the Genesas, resitting the connectal importance of any decaled that would prove more effective than There is no isothere, to discent the providilities in

netwerks Decrees resultable for a tures, for liner 26 and for a long list of other translable chesical addressments are thoroughly quality of devicting some power which would be effective in the est It is therought recognized that he single chemical dresing



ately in its fir by passing () pe. 2: The reli-str \$: The three-h



No. 2 turnet of the U. S. S. "M

The Battleship "Mississippi" Disaster

The Elaborate Precautions Against Premature Ignition or Explosion of the Ammunition

III. THARD Classer on the many control of the contr seem up in all's bage, and after the I was fired there was always a post ly that a certain assess of steels sed pewder gas remained in the bare other with were berning frequency of the silk. When the levech is spelled the cratetile air, particularly if the ship is steaming head to wind, is indicate to wrong E through the bore, expelling this gas end the legality frequency and driving

Consumed our words and reference with the

Observed per never and uningles with the origin of the oils in the turnet, then many fight, and if a new charge of preder many for the next leading is in the burset, in is tishle to be set on fire. This is what coverned in those early maters, and investistely thereafter several severagthere were taken in the design of the magnain then being and of the tarrets themselves, as well as of the delay mediation of the mass as eliminate this denore. The new summercents have proved to be very successful, and the little States Navy has been singularly from for much a quanter of a century. from Senters of this kind.

With a vice to reversing the soldle on to the safety. of our proved terror and buttlevery practice methods, we proved the accompanying discoverable show

use to the left in a through a barbone and terrot; the view to the right in torough a naractic and terror; the ware is the right in a treasurem vertical section through the same; and the overter view is a horizontal section through the latter. center there is a horizontal section through the untert. In the first place it will be netwest that the amount-tion (peoples and shell) is control in associates which are localed at the very bottom of the ship, and there-fore along 30 feet below the waterities. Above the magazines is boilt up a devalue historite excessed in inagament is tear up a coroner narrows someon in beavy armor, which is shown by the thick block lines Inanodiately within the wall of the harbeits, and

arranged in a riccle, is a series of lescoy vertical plant glofers or peets, upon the top of which, at the publi

of the turnd if will be seen that the r rimels retracture formed in three tions, all being integral with the arm section, with its topmost face to upon the trantable at A. Below fiver is a section of smaller dist called the manufacte handling roots, and below that is a third section collect the shell room. Extending form free the feer of the tarest and terrolasting

near of the free platform of the ship are above the first platform of the ship are two uncranition below. Also, there is an incided shell held leading from the first of the shell room to the root of the game, applican held beating from the uncountries

and in antisential used wetter from the amounts of healthy roses. The them gata are monthly as Courses certified, the them gata are monthly as Courses certified. Their treasures pivot close to the purplishes of the curred, to as to necessarile as small an opening as possible through the heavy protective armor. Aeros the after each of the intent is a steel believed which officer in charge.

of ship, shell and newder balan-

re disaster which has tily as this spile despring the rough on stantion by a special est Board, and ofpositions used ster everre Of the disgrams of

wing the coastro snowing the constructurrets of such a madand the restly ppy" and the restly s that have been

that walking relative will be pathered to ex-plain feet here the

An Advance in Trench-Digging Machinery An Advance in Treatmongging management profile contential digiting of treatment for the sweet I and desirated bits long been a problem, the actuates of which many overcome have sength. For yourselve standard sloved and despites have been used on disching and dreatment. But here many difficulties and despite have been the desirated with many difficulties. are exceptered. A shared must struddle the trends put to work upon these, the firstlidity and mobility of the nearlike are curtailed. The mate have to be immedgo the machine advances, which remine her time and igher. If the walls of the trouch are but first there is alvers denot of a cove-to that may cause hears of felor and inchie. er a wide treath with eleging sides in required,

the dragitor is settefactory, but it is next to inquestion to except a examp-out deep toward with tide type of Tiere has now been developed in n

g treach pull-donel, which is a neal way in the privater a treat path-store, which is a feel step in the advance of treats digging machinery. The manufactures inte-centified a parameter, of contept of the desgine, that of backing away from its work, with the digging shifts, of the show). This marking is a facebacing above in every sense of the word. It is driven by a gas motor to monthly on receive (made and to birth-As it looks away from its work, it is always on thru greend, needs no reads and power has to stratellithe trench. It is streeted and corrected by one must without swinging the cab. Its high mobility and power of its point stowhere and other the norse

Bruidlity as that given by the dragline.
The pull-shows begins where the shoul is standard short digs, the more post It how, Thus at depths of greater than furr feet, the power is almost inst. Notice the season work this marking dige a sensore compelled intert situation widor its dipper which come-24, 25, and 42 techno, and with the long reach and full diaging power is will size any depth up to 10 feet and pile optickly and easily to spoil busks with the same now in the stanfard shood. By a classic been, it can be converted to a di lips in a few lastry time, thus with two

coss and the machine, the contractor perhaps to headle repeticulty any kind drainage or sewer work Should the operator require a crime, he on, with a slight change and the dr like local, have a markine that will handle a compand chambell, armoravel. book-block, or pile-driver leads and by changing to still on additional lesses, the

ther attuckness, the operator has four assessments The cost of moving from one 5th in mother is greatly reduced by the paillelevers. It will become the 5th, lead itself on a standard flat our under its cent power, and can be obliged hithout dismanting. This feature eliminates the total high cost and lost that This feetible emissions the total sign rose the local sign of preparing the reachine for skipment, by reserving only house and cateroillar hose, and execting them at the destination-recovery operations emonstrond in a suggestion collines. The pull-shared is always ready



ges of the standard shored

destruction, with no ive in petting ricared for

HE beerfield liber star-The control Version and

at Groenfield, Marfarting sleept drops in stan multer which could fer in a length of 80 mile At the upper end, for ever Pell Sect brings hank- in sourcely settled stry, giving un bond b ting for water strongs. The

ng the water screege. The agent development along the other, known as Disale Bridge, in completed and its commission. In this section of the country, materials suitable for the construction of earth door, are modify available was therefor releated The date a Darie Bridge to probably the taplest earth-filled dark in the world at this flow, though we are informed the the Fedbel Marin Revisitation Service has after our orthus work a dam of greater height In testiffing an earth \$11, the first of the tiver much

be by present its order that the fill and be made. This

The or estruction of the fam, showing the spillway mouth, and the high hills using the site which made the usual type of spillway out of the question

out be converted to a standard shows. With was date by debter a discount restel around the deat, through the rock on one side of the side Darls Bridge Sch. this new-sity was circust. Inked up with the construction of the spills ay

> lete this method of carrying of the fixed Nations to have becamble it has been undersory to construct moved topassence, it can never read of the date. and the temperature plicing at one read of the date, and the temperature has meanible been not but to receive a said was channel for combatting the nater from the first of the selfings person doors the hilberte and has to th bed of the river. In this can for the bill-life from

wednest day to covering Not a n-educat splitting way feet residented for the Peris Teldyr don. High tests figure for years bard better, todirated a new sare reports for the addisors of JURE vitter first our serand the regions of the side spillway of this saw it udent over formidable serie hen and high evets, with on e inderculate danser least of the case. therefor dotted to equality the problems of carrying the first values through a



The vertical quiltway at Davis Bridge days in act

est of the billiside channel and patelog permanent unt for the named which had already been rut. Hydrath twee upon a weeking model burning indicated the freelight of this, the plus was adopted for the splitting is about 350 feet openeous free the like of the data care. On the wide of the river where the apilitary is invoted, not tennicities was found splitche for such as intoite. The enterance to the The entrance to valificate is shaped him on married from 160 feet in interfer at the receth and restricting gradually to the

some dimeter as the tigmed to which it into 225 feet. At her water, there of less of this been, of course, projects above the suffers of the stream ways have leve tood in south focus, but on such a large wale At oblevion which make he adopted wild red upon the fear that the splitters would exceed air it wash questify as to offert writersh its nater especially and its prierral operation. This was perhaps the in estemplated carrying the maximum firm of 37,000 second-fret with a server fast depth of water on the spillings creat.

final design presiden for a court with 16 bridge piers and requires a double of gates at the error of eight feet in fixed water milith writes in a part of the addition has a "her-rates" consection, equivalent in stea to a citric 22 5 test in diameter. It shed to make the method spillorar shaft cir-cionomethic, and to reduce it to a spillorar

disputer of 225 feet as one as the water, failing one the quillery lip, could be accelerated to the regulard rights, provening the next more of potting in a terred in a feed-gree legal a ract of which would be selftent at a low Gride in the sarrounding elevations circular in encountries and the returblier would return of transition from dreater to "large-shee" plage Harling flord the foregoing frequency of the shaft and its competion to the spacel, the next step was to design the spills at the and the conventue section. The velocity in the latter section at full equality being 65 first per second, it is entdoor that the nater must be a fire, fractionies full of near than 72 feet, it enter to attick at, and the time required would be about 22 secretal. Bureauch as the water and have an initia befored the carriers of the water and here at 100 befored triberty when it power the spilledy Eq. will take a membellic respect to its few full. If I free full should legib at the spills at the horizontal velocity with a wave feet book could be profile, exceed 17% leet per world, with the most Sect regal not provide a control of the discharge per Izone. At the rate for the total the large, a circular softbase All the fair for my paint to make, a tilease species, he with a notice of its post would be required and the merage time for the noter to cover the berimmen distance from the lip to the ceilinfried short words in 200 seconds. The disgreenest between the intehab of the required for included and vertical travebegin at the selling lip, inserupt as the let would have uttamed its final vertical velocity before it has market all the way from the lip to the sylledistry shelt- better, that tip must be in the nature of a fer writer of high discharge coefficient Staying arries of these decisions as to the practal testance of the design, the determination of the netural details was a matter of Test and Ire."

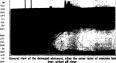
Saving a Rotting Concrete Bridge

A second puruled befor of steeling depth.

How Good Cement Was Injected Under Steam Pressure to Take the Place of the Bad By Harold P. Brown From a point in the copies of the delector director over the line of deepen erosion on the burr of the arch a vertical hale two and a hart inches in dissector was defined a point face 12 fectors above the surface of

LY in 1220 our eletrorer of a large can opeto sech teliko at Disrilagion, No Jersey, was tagail to be wellessly injure the hour persturing took and the effection pland at the show-larks were expended and undersalmed saving the entire width of the leiting und dangerouse crossis but developed by the ands ring The farmer, between was considered super ficial partil the work of result was began. It was then een low tide and high

tide levels was selfstaff could be wraped off to peked into it survives letter was nerthies, but It was decided to try a sorrel vasted by the second of ther, the originator of the stransisting macrete proccomes that nyme meet The retired was spream ful in additiving the act eged mare without conveniand a royet characteristic perfect condition after four park woke. A description



of nalse in acring other to administrate for service broking analogythesing; for place ing seb-foundation without exceptation; leakage It dates or cased basis; and in solidifying file of eighters or other home majorists.

It was decided to reserve all the softened concepts in the exchal ones: to store the section by the Brown bal with a lot of super-lected steam and published and to core the lowest favo at once with strong-jetted created market from the restrete absorber. This hardess sinced feetandly and is not injured by sub-narries so the tide rises. To obtain scaling, however, a hard surface must be provided to serve as small to receive the laquet of the stream of concrete and to

When the requir neck was started, the next were directed to new scrapers to recover all selfs material matti sold, uninjected restorate was restrict. face was therefore a moral until in wese places a depth of over three fort was reached and the upper course of arch reinferring role was expect. The nestrict was still seft. It was then total that deep below engine sity he made accordance and no self-d reservete crafttop and now the north end of the beings was carried by the aningsympt brase craft of the train lengthyligal releferment of the enter, abid to a client extent The bridge was waittieve.

The writer, who was in charge at the condex found that herp pieces of the actioned material dug from the abstract and placed trafe arran present were cleaned of all did and impubiles. The send which was left was sharp and the approprie of good quality and preserts simplifieded. The playing the clean play is able to the number of the little of the beat of the beat in the transfer of the beat the contract of the co and for such the entent was and to protetrate them many and produced a solid concepts offer enting weight believed that he a modification of life prehe could remove the said and died from the softened stratge without countries and at once inject last respect cropp to \$11 the interviews. He had already, in along a count bank below when a till supported the tracks of the Lackstowana Soul, and had checked a stiding risder \$1 the feet leng and the high on the penagitude Real by histing specimend steam followed in charges of lot great under present. For setting of these bin was subscriped twice a day in dirty salt water. No other plan of saving the bridge was supported, and he was atthefired to try his method.

the covers. A second purallet total of ethilist digital rays fellind 12 inches to the cost of the first, and a thing brief 18 inches to the west. As the thir fell, storie at plant 20 pennish pressure, healed to 300 degrees F. War applied to late No. 1 mail it demed out of hall No. 2 as clean water. This was temperately places and the pressure slightly increased until clean but Water

> ed out of hale No. 3 and from the readed at Het grout was then applied at love No. total it filled No. 2, which was then permanently plagged, and the process repeated until the events up peaced to hele No. 3 and at the betters of the arch. It was then exhibit that the dirt and the self had weeked out of a criticaler with a discreter of three feet

and the intercies filed with new records. following day it was found that this had hardened, is te of the immediate rising of the thin The process was continued day after far until the

Close-up appearance of the affected controls, showing the exte

other place man of the abstract was so Yest have into the restored expertis delited at the end of each wook should that If was already harder than the descriptional concepts about blots renter. After me the discount of compute above high water. After me storing the exclude interstellar mass of the attenues, work on the couled satisfaces was taken up. All mash industry seather was removed and the run was sensed from the expected relationship role. State was most to be, a hard of result publics against the confrience is take at the still satisface of this water. A concerie with one part cereor, there parts sand a

two parts fine publics was then jetted on to the he surface by means of the concrete absolver until the surface approached within on-built inch of the desired level. The publics were then belt out of the concrete and an assessed of distanceway earth coast to air S per cent the volume of the course was added to each load. This delayed the set of the coursele and per the creeks were chiefed allowed until solid me

terial was reached. Then the concrete carrying the time publish was used to fill these to savethweing. The publies served to drive home the creers may the bottom of the crark, blinding the surfaces fruit regetter. Without the use of publics it is impossible of the cracks and creations with projected morter, since air notices in the decreasions defect the hortists of and and ceneri to the edges of the holes until the surfaces units over a cavity. In the matter the publics drive the motor initial the reinfering colocutifics are left when only morter is used Of course, when a stream of stream-detirel concrete strikes a wall storiger the politics and subd boated away and can be used over again. After a thin layer of mustically need owners is deposited the rand also adheres, and Whot a layer of our-half to three-qu of un limb has been built up the pebbles imbed selves and remain in piece and their huport freese the mortar limit the interestion of the heirs, stone or con-Steam-jetted country has been made to after to polished flist, and even to gloss

Many builders believe that reacrete is injured by heat became they have tried in winner to heat the materials before and after solving, in open need reveyterbe. restart with the netal betten of the telerr and the result is very unexticiartory. But when the heat is result is very unecoeracy. But when our next in applied by super-healed steam under presents in a closed hash the effect is suspending. The heat serves to open the pure of the caused particles and the armount drives the moisture in an itematical that we perties is left unindusted. This is their increases the efficiency of the creases by 12 to 15 per cent over that of creams hydrated in the ordinary way. tion in the sid which comes from the fact that the hor

sent cours the entire surfaces of the same prefer the of the accreeate with a thin ner layer than is given when makes the ectaont still more efficient. And the client is rearbed when it is realised that the best serves to carry gree for beyond that attained in the ordinary provide of

The net result b setting. The net result is that for a given crushing strength about-jetted con-crete is resits a cut of nearly The Institute of Physics

FROM the annual report If of this resemble British body it appears that the de-mand for highly trained and qualified physicies at pre-ent encode the supply. The report deals at more impair with the new monthly Jour-nal of Bottonijo Instruments which is being produ

which is being produced by the limitine and officiel and the National Physical Lab-stratory, 21 data refers to the Tursico in Industry, which are being of static this cuspicos of the Inditions and a weame of which will knowly be pubblished to dead Chierraday Press. 21 is believed that the filles of those lectures and what devolutions. of these press, it is selected of these between and their old infacturers will do tatach to adver of physics to bedouty, and to extent of physicals, qualified to us have physical principles and knowle

for at a point upone

to its energy level. In attack (retretaltiers it may be ap have tubes. At the revolving end the extent of the deradio modern is contacted through a special operator ancillar to the climitar

why The variety life and he kept lighted out integer with the studie

is to be ready for invenious

cells, but the current out a postigitive part of open

ultraner Ossibeite fo

value of an attendant's time. the use of tales and power

in this way makes possible a substantial arction.

As to the effect of later

elgoriting system full. That this argues after the reference to the com-

Taking the Ear-Phones Off the Waiting

THIRTEN years ago, Lewis M. Clement was a radio. I operator on ship-heard. As he stood watch in the form radio rocus and fat the 'phones fits deeper and deeper take his ears, he wasted that sages day he would design a system to radii querahear by bell. This resistant now bears fruit in the radio colling system on the proper with the law recently designed to the proper will find to be her recently described. he has recently brought out. The system will find use in those new applications of the radio telephone in which a continuous watch may not be necessary for the public safety, as, for instance, in shipto-since

The new spates is an ingentions eduptation to rect of well-known wire telephone apparatus. Helefy, is consists in putting a 185-cycle alternating current into the radio system, transmitting it as other frequencies in the veice range are transmitted, and at the receiving end using it to operate a setallite relay.

To stoody the alternating current, a honour uneva-

by direct current is used, and its output is pussed through a fibre network which suppresses hermodies of the 155-cycle fundamental. Accorde mechanical coping is rescuid for both the wheeler at the sending end, and the establive reiny at the receiving out. So closely can the rolay be turned that a difference of ne-cycles per second will double the current coupled to operate it. This inages that static relephone signals. repretts, orc. will have relatively little effect on The way it operates the next relay is a further action against false signals. The vilousing relay protection against false signals. The vibrating roles may close its contacts for only 1/2000 of a second at each stroke and all the electrical energy to pail up and hald another only until be torsed while the contacts

are closed. Itto a relay of normals site energy flows too slowly for charge of it to be stored in the form of augmetican during such a short time. But electrical too sleafy for cheach of it to be stored in the form of magnetism during such a short time. But eleverical othery down rapidly into a colorisor, and so the che-cel is accessed to charge secondar-found condense-daring the development of the production of condense-daring the development of the condense during the development time that the vibration roley contacts are open, the condenser directarges along through the second roley. cutomer declarges stony library lite second relay, and this represt is still drain or when the contents done again to excharge the constituer. Thus a continuous painting current form through the avoid relay, and contains it to close its contents. These contents will in sperate say electrical derive, such as a bell, a

street home or a selective autich-The use of standard train deputring each enables the states to be used to call any one or all of a number of stations from a central point. For its stance, the central operator, by number a key marked with the name of a particular station, can send out electrical impulses which will operate activities unliches at the receiving stations. Each of those switches in erranged like the excellention on a sufe, to riose its arranged life the continuation on a safe, in come the contacts and ring its fell only when a certain conditu-tion of impoises is sent out. This apparetus allows so many as 75 stations on one wave length to be signelled separately. In addition, with a further slight to-differ that its accountation it is topolible to extend the system to signal all or any one set of axee than 200

While this signalities system will be of decided but portunes to many condigations of radio beinglasts and ringraphy, currently spread it in but based on any starting new discoveries, but patter represents the adoption of certain appending that is well known to also indeshoos. The Historie locat is fed into the sharp points or edges, between which is an inequality



sparatos for calling thip and other radio stations by bell, so that the opera



The ass ied lightning-arrester unit; by turning the upper elec-free and can be easily durantied. Right: The prothe glass shade lies free and can be easily discussibled. brush-discharge to action

With a further increase in the witness the discharge covers lise side of the glass shade. bronce, tests above that the exercical and conducted trading of the meeting closuits and appearing is so effective that suffer telegraph whether shother to those es an L. C. W. or spark transmitter would replie

Spotting Icebergs at Long Range Tolli menure to matherine from footing levierge is well known. These long testinal develops, in spring one or 20 degrees torth intitude; and off the foundland lunies as ruce, as 250 of them have been

observed from a single skip in 24 better (ittly one-tenth of the mass of a familiag berg in thible, the other him-britis being enterpret. As metring proceeds, the exter of gravity slifts; and a berg that leaks as well as Gilectier to apt reaktably to the cure, with discrete results to a skip which may have been at an account heaft distance. Libraries the innerved men is of such independence expent that a this may ground on it while the pilot is most laspression that he is still in sofe water. We all repeopler the fate of the "Titutio" In order to swith these dangers it is necessary that

the aggregate of the leeberg be known before it becomes width. The nuttheds hereiders usualistic have not been particularly reliable. Ordinath they have depended upon the observation of the water temperature. But these observations departd on largely upon regrette. as well as upon the presidency of her mores, that they comes be relied man. Liberates, no indicating is to be had in this way of the direction of a suspected berg. To correctne these two side tions, the house of Zein. in Jens, nor offers a "radio-intersector" for betterp partie, a thermocouple and a spherical mirror. The latter gethere radiant energy and directs this to its can from where the themsecupie is lessed. A galdifference is rediction The themsenger condition of nametous of

Three are formed of two metals or plices of different These are formed of the metals or alloys of different character, without copiets at one cut and free at the other. The free ends are connected with the gal-sations/er. If the joined only are leasted, as elected, current flees. There are certain and well known relareferred. It consists of two statistics formight with tions between the degree of heating and the electric caregy produced by it.

The therapologic in enterpolars of no high septlater of air or well to a bet-The Herinar shiple ills offerspielers of the high scelladity mand be posteded against any direct of size. Therefore it is enclosed in a variant title, from which the air has been calcasered. The nairror has a silvered frost see that the multi-be lare to 4 to go through the frost so that the realistics have bed to go through the glass which would absorb a part of it. The shivering is protected by a conting of coincides harquer. The re-factor with its meant is continued within a uponly socking and have at the center at unchinered releasement. lead 20 millionies in disseter affecting a few tiew

> There is temptation to describe the nork of this min-noisymmetry in the bandless of ireletty as dynamiing upon the 'tradiction of cold' by the berg. This, of comme, movid by innocentric. The berg, herge at a temperature some-landwels of degrees above the absohate arm, he is fact medicates heat-lest less only of such low bacasity as to give us, with our finded carp of intends temperature, a secondar of rold. To the themsecupic, lowever, the language received is arrustly or of heat of how intensity, and to this breache it As it approaches the berg it gives a galtabaseter reading in preventions with this dart; and it is directional in the countries. An idea of its wood tion pays be get from the fact that the best from the fuzzola of an approaching vessel will affect it at a distance of six wifes



speech unincelligible being before they would make the

tions in religion. Any statlers, or less that matter any

ple that revenir the presence, and direction of icohergs, shown its the focus of the mirror and (right)

Glow-Light Protection Against Lightning BY utilising the percentre qualities of the brack the charge, Fe. fissing L. Meyer of facilit, has developed in increasing true of lightness arrestor for electric which takes the place of the well-known? her type of arrester. The appearant which is shown in the acceptanting (floorastics, automatically effect a brack discharge at the mount when the tensor is augmented even by a very exact awayts over for next

> kind of glow which swielectrical percepts without tendents Purtlemone, the when volumes to redden glaw is train in the form of a college or shade, my The electrons an In the term of rakes, not shares of a number of flat ten ways with sharp-right tredo are arranged so that the strike cross at right angles, being separated by air layers and the place

If a everals reliage, which can be called the "year fraction," is expected to the Dr. a lend dicharp takes properties to the Voltage III cream, coal it file the als gap and makes it outdardly.

in set and usset, made from this scale

America's nearl industries, having been developed drong the just be years. Proph escar divided industry Americal releases in the color of preparation of this volunties Inches targer, see over new numberturing large The Japanese also must begen making Deliation resels of excellent engine general parts of evolute quality. Today installed peaks are though because of the still competition betwee the American French and Japanese product

Even the parent manify people" which can be dis-

in expert.

Fow of the tadks over dress that the surre of the pearly is obtained free Enrices Sup speller to subs lady's ladestructible years brudy coaled with a quer, the signess of which is erastelline granin per

sires of the main The leatent within of energy divisal, with widel the haltstice per are realed, expute on the scales of most fishes and gines then their electroristic buildinger ed under the microscope the microsia substance is sees to be enaposed of various sizes of small blade-like stale. When the enthreads of the scales is excellent under vestor the Indiana numbers are appropried lts the stude essent arrend titues by devantation stages were ride to arrive that the course is effected to for a considerable time to penult the digoritor

of the professioners suitable. The concentrated supersons is pesti eventor. To other Improved methods the Instrume regulations remended in services, annel sectado or other organieducate, which are columns of the attractition of reliable scripts brooks. Pend means limiter per seem took privately out the appears step-taket se if turn by stelled with a brown like arm resilians

freedom from order and in finences of the expetition when slightly agained gives a galage and used house illust "whire effect." The most desirable robes an silvery where any singletty pink. there or brown shades of color are understable

The bride qualities of pearl sessive have uniformly to the stor of the tok Iron tolk likes are obtained These fires the heater and sheater me employ unmake a fire point receive of higher quality that these obtained time the bast 11 F Taylor of the bailed States Dizzon of Prolesses has proposed it method of a mixture of durpe and visual repends. Turber's supgotion itroles the reportation of the house and small espetals by Irrigation or fractional scalingentation. The through a large factorist glow late or a large I take regulating the rate of flow as that the larger expansion regulating the rate of first as that the integer expenses have time to settle std, but the smaller sees do not. Touche abrahad alreful restills by assumentation in buttles. He tide process of exponenties of the larger

Jewelry from Fish Scales A New American Industry, the Making of Imitation Pearls

By Donald K. Treesler, Ph.D.

ists number of good quility can be made from shad make. Perhaps the larger gratin crystals could be ground to make them exitable, but this loss set been utilized to commercial arrective In making the was-diled leads the to settle, the appearing is described off, and pure printing Soli gine is not in, so that a concentrated powhiten is made, an applicable is maked, and if a first

that is desired, a very small account of each or so to posed. While has take interior to laderted with a for single late the heat which is being revolved on inside of the head it may be expect to set quickly by beholding a little either on the opinior of the lead. model exponentials of the other childs the existing and sets When the beats are dry in-dir they are filled with Equal parts of Japan was and periods are often

used to fill the beads. The cheeper gracks of holisor ries leads are bloom in such from tablite will, colories plant.

By one proper wild "nelly" or "tree forest kepts. By our proons said "little or "spec plant levels use disped in redison years empter run disting were griggly and allowed to fix. A protorting looper of paragilla or criticion actate in a raita school is then qualled to make the counting waterproof

without in then applied to make the Three countings have be sooted three and the figure political with character skills and underied directly into must metate, in which the symmetric may be disselved directly, making a larguer that is qualled to the lead. When these salvents are used the longerst may be tissed step desired state of nater in the subfittion of minute unantition of the autro-

priors does.

The build for "indestructive" pourls are, as stated, solid said of spail or sails gloss. Tary are inside from toling with the hele of reliable size for the hele Appropriate lengths are rat of, the bales are triagged with a refractory temperial start as tire ricy or graphite, and the please are then bested to to selecting point in a resolving less draw portially filled with pendered tale the leads are all shaped, and mediated satil they

ry cond. D. F. Tantor of the United States Surrett of Fish ries his negativ (exhel a ten simile mathel nomerical a neuril leasure which programs certain adsurfages over other methods. According to his process, the fish water are rabbed in water to resome the valu-able instruse particles. The semesakes displied in fraince of, alread to missite, and the experience trace, manufally say least, is declared on. In-reactivity least supervise, measuring the latters both by at smalls, is traced with a disastic winter of pepch, two and a helf grame, and glateal scells with. He calls continuous to each line of field, and allowed to not 40 hours. This completely dipode and recover all the providence-size matter from the glateal crystals. After the digretion the statement of the crystals at thus, and they now powers the parallel property of being more randity wated by other and metals other Indequate minute. Advantage is taken of this property to obtain the clean crystals suggested in sulvanta

diposition mixture and stands as a separate layer or tion. Down graphy residing the container the instrumcrystals leave the water and pass jate the other layer leaving all dirt, organic matter and the life in the secting all titre, organic matter than the first in the water. Any fatty or wanty substance diserts in the other, but these may be removed by attenting the cry-tals to settle out, decarting the sity ether, and replacing it with riseas analysimous other. The bestwest crystals are new circu, brilliant, and can be kept indefinitely in the ether or can be easily transferred to eith neutric. Nitrocritation or critation servate may be dis-solved in these solvents, thus forming a pour increa-which is model directly to the bend. Third pourisolved in these solvents, thus forming a yeard increase which is applied directly to the best. Thrist pract-map to prepared by dissolving relaxite quantities to estable does for the langue. White researce d'Urient may be prepared in contacte quantities from this scales, jet it could probably be prepared at a lesser rost in the chessical infection;

Pour everter is teed in the manufacture of man

sengments other flux Inipine, etirkpine, waterliche and many eiter objects are often ernamented with this the taset heart from the larger It adds a new lighter to bulerlite articles. If it works a little chapper it work find taxay new in hope light description.

NOVEL mode of re A NOVEL made of re-meanth by the Assert can Massers of Nature combine of various

with a Sash gap. benedication buy been carried out in the reinforches of New York and is Next Heatings, where the life blancies of passe of the frage and leads have been determined with an appearant to completeness. In tife beland occur not only the largest tree frog in the work but also the most powerful, if not the largest, ilmed in the American-the richnesses ignore. A source group Bladenting the home life of the latter is being installed. Since it liese in seculi colories, digging its harrows through cliffs of freed rough, it is treadily to illustrate the clief features of its histogy either assecureding or detrotting from the artistic effect





Inventions New and Interesting

A Department Devoted to Pioneer Work in the Various Arts and to Patent News



To Check the Reckless Driver THERE'S a law that offer a collision or sections of any description the actions followed the and investigate the datage, identify hisself, etc. But this len is often more beauted in the than in the observative. New E R, Stures, of Seattle, with an reses E investion designed to step the lift-len-and-run driver. His desire is cushedist to the beauer, and would be preweiled epitigenest for every car. After excises between the bagager and any object students the ignition wiring in elecclassified a said before the companion of the friver must slight, go arread in front of his cer and reset the busper switch. tis engine run; and delay it, offers or stepholy also gains the opportunity of questioning him or taking one other appropriate action. Sentile police untherities who tested the device out in service decisied that if its new necessarily wade computery it would be provingly lequestic for a moneist wise strikes a pedestrian to escape unidentified, and the investor is now attacking the prob-less of getting it standardized and



A New Sensation for the Kiddles BRINGENG the beatswale's chair to lead and making a phything of it, a Coverant manufacturer has apparently given the kiddles asserting leads now in the way of a theft. The "witners." as the new play apparatus is becard, in described by its maker up a two-wheeled rapter justey with a swing went; and The counter rape to \$5 feet of marries New affects had between two transport other The speed with which the piddy whiten does the new carrying the streeping rest with it, is determined the stopened was with it, to necessarily by the pitch of the rope. After swaling blusself in the swing, the percentage as badered to the higher and of the rope, offer by a plannage or, if the pitch is not too great, by his cam offsets. He fewed, he than gris is theffing this to the other and of the cape. The heisting the other cut of the tage. The mostling cope purses over a palley that is Asp-stately attacked to the tree, one and is made fast to the frame of the Passing. patter above the passenger's head, patter above the passenger's area, the relact larger free to the latel of the holster, of this pattern one too feet are fundated. The manufacturer segprotected, with several process on this free end, the trip up the facility cut be

made altered as speedy and exciting as the side down, tir. If riding without the nork of politic bimed berk, the provener on place a ladder against the

Alarm for Bathtub and Ice Box A DEVICE stacked to the edge of the dispose under the lev bes in so grcopy (but an alarm seaso's before the water proches the has then permetter



arm ben and the first has several adjudgests in regulate the quartity of packeds to regalate the quantity of water to cover the container. As the floor, which rests on too of the water, is rabed a tartic special, which he large the starm bee, thus ralling strenting to the first that the mater is appearable a level at which the drip-pat trust is

The device may be used on the edge of any true of bathcab to give notice when the necessary quantity of water medel is in the tab. This may be you meded is in the 160. This may be pre-determined by softwaring the arm which accounts the first on the surface of the As the water marker the ded udet in the tab the above events, leftcating that the bath is ready. This does negy with the necessity of watching the water rep tate the tab, in the megatione stirwing a person to be engaged in other allowing a person to ne explane -- our duries. Another possibility that sugges itself in the tree of the along to presen the builting over of fields.

For Smoother Motorcycling

Methodacycle enclasies are leady
divisoring a new front first that terior yele rider has had to undergo prewhen traveling over rocky, made Treds over thousands of be beard proceed that this new fork repdecreased, adding 100 per cent to The Seth in helpeless in action. The

ellusares lumbleige sibration. spring stependon gives the fruit wheel the same distance in revel action as when compressed to its limit. The front vertices are principle to the Weight of the rider, so that a rider weighing 150 posterio will get the same neither and then tible wighing 20 penals The spring design facilitates was, ing in fork assembly. The fack errors is in design. The frest statistated constructions



Trapping Sparrows GENERALL IN HABITAGE, DAY THE fidently as a "plagar" of spotrose bone of track-puries staff per base tett. the Historian stages has the provent a trace of operation of a funding is a souther-drag. Experience indicates that the conting in the same successful

trapping hear, and it is then that the The Self-Propelled Rail Car Till per the year law shoen a wearaint sies les seedly large-ing nillbutten of the set-proposited rail At the process time they are in writer but 400, on many where much, but a considerable number of large trank later have our or more of then in specific As a result of not-tional converses with this time of equipment it is increasingly existent that its field of meditions is establish his wider then was at first apparent It cles has been from their while the scuil, light-weight car of the motor-less type has a definite phon in the transtype has a detaile place in the frine-partation field, there are other places where a considerably larger car, driven is a more powerful engine, in devicable. The year 1963 added our-identity to a The year tigh agree represents to a bear and merionical factors involved to the problem of the self-propelled ruli [try] progress was surfer in the de only were engines of greater person up siled, but new types of control and from The siresty difficult probbes of trus-

for dealloand control, and several cur-



ing is claimed recredly least have been designed for atch operation (of the periodal frame

mission tectionic employed, merintaleut rietro-perunatic and hydrattic, the lator at powent appears to effer the largest

A Mud-Hook for the Mired Motorist

A SHIPMORE she and insect in cutsed Water Rice of Williams part, Pa., to invest a "RESS-back" for Lor port, Fa., to invisi a "Hibbleon" Lie attembride. The invention has been pleased in several severe best, and a patent lire been applied for. It is com-posed if heavy quiber, and all its parts are valentined bearing. The lose of the destre is like the attrice shar of an extinueddle tire, and on it are vulentined two rather ricets. Through the rubber shee a strong stray is run, and on the eard to the motor our wheel Mr Bler was motoring over a self.

sattry reed not how up when his car Mr. Hier tried to tame free the cur to and, but our find went this the wiles. They and there he systed to be lete in a windler to. The result was the

The other day Mr. Stry west to the same had spot and found the mind tool





cal view of rubber-su as thick. He can his our late the raise, attached a "mad-book" to such rest Primarily the "prof-hooks" are for spoke wheels, but they may be attucked to disk

wheels after this slots wide stough to drilled through the metal of the wheels Rubber Bearing Takes the Place of Babbitt BASSITT and longer have held undipated power so hely as surfaring

legation anothing taking their places. It now teach easier, livesowe, white one considers that raider properly compossible and rabassed will stand alon after tests better than bronze or bubblit or even street. In a recent tent in the Berman of Standards of Workington o nieve of rather out foun the treat of an autmobile tire steed to rader the Abrasion eight these letter then uses Subject striami bearings for engines skells, etc., are a Though the are a response tively revest outperfug artifectural the results section from lasts are much remarkable. trifugal send person wide b bandled 10,450 tons of course sund in IEG hours. At the aptration of this time the leadings and shaft were fastal to be in serfect mouli-This waste purio with either hale bits or broner legitims levi sed level ofthlarger than 125 levers without appringation and harder tentermore

tion of the rather-surfaced beining to they are expected to water o nelstore. This forms its own intrincing for the bearing, because the rotation of the shaft forces made over the surface of the bearing. Water-lightnessed rubber line a latter coefficient of friction than an ethel building surface. As a reagh their in him friether and stear in the other leading, elaborate ciling strongs tor incorrollie pumps are disce uses with said, because of the besture of the raisive, wrieting or West on shafts from

with participa is stronger. The rubber boaring has been a been to skip enters for use both in bijer jemps and as elect take bearings or agniaries by eliminated the trestiences and sentractive properly religion for the collinate of the raider bouring also me provides for only industries of the control of the processing "simpling" or exceeding though

Pitting best traders at least and non The Electric Valet taxue. Or if you don't have to say ry, then weld them out and wait for photo to get a basic on it is also plasted that a few househit sittabe individuals have wrone that can be ben; but each tors, screening to at least our nessua, do not deserve to have when sit all. Perhaps you like in a sier landlend kerps konempronge finer see when see my to red year own with an electric loss willle be page for the angion losses. The sets renninging volatiles of the problem in to wood for t tabler's beautiful go to led gardt in-

the classic horse The electure valetie mission in little in e frequent It also men to the pressing of writing morbiles, her if they not chies to operate on costs. It will press your "true" without a struggle while you show, if you show with straight raper, or while you shave, week, oven futh and arrend to the forhere if you prefer a safety. And it was nator is you preser a receipt. And it uses delta, execular to its numericatures The device consider of the shortcoated hapend stages control with cirtle, and a partition or and that is placed between the two troopers legs. This pad motel the electric resistance or beautity cettle that do the desired work. Its or rish is designed to be substraed with a risch sloped in water. After the pad

has been put in place and the sec

obstituting the electric arrunt tor wrestling with heavy flatinus



other the sides of this air cushice for

stor if, the initial top of the tase, in rightly classed and the current in turned on. About twenty minutes of lead dars the trick. Yet go forth to procedure on the bow, identity year follow spicyces to wonder wip on earth you and net like, are given preferred when it exper in tasking resentions.

A New Instantaneous Gas Water-Heater MINIOUS are there classes of water Theorem-the neutral, the attreasts compressed the instationers. The every and the instanceous. The water is wanted, and our must reason for to extinguish it. Failure to do this has retried arrives equinities for steam revealer. The several class, known as the automatic storage bester, ligito and entinguation livelf anticestically and keeps a mandati tolera- of levitel water in everyor in a tank or befor at all tiers. This is highly exercises, but it is expensive. Study a heated furth for he effert ar weil an its fact a bei-weiter radiand. As it is constantly calling down, the agreeastic derive used from that to the term on the one to redent it. In time turn on the gas to releval it. In winter this heat is, of outcom, progratily

velocity in leading the house, although in most player the rost of this sort of 'hearling' is high, for in next places gas, is high. In warrant muchly this heat highly underlyable. If it is released to the life her that room is kept at a "read in operation, lights the gas whetever hat-butter factor is opened and turns of the gas when it is closed. The change of Native pressure in the mostle whereto this is effected. The water runs through a roll and is brated as fact to was

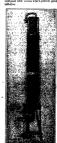
The instar illustrated is of the full instantaneous type. In addition to the coll which is evenuou to all heaters of this rise it has a detide-shell cashs which is filled with water lack of this, averding to the manufac es, a Newalk, Connecticut, fen, la that water awaitst between the critical cal shells furnishes a most prestical beat heat and loses its teltist rbill before an tering the organ heating coll. In other wards, the water first elevators in the ebell, then in the cell. In the fermer it is probested by means of heat that word reise earge from the neighb of the cold

Riding Twice on Air Will'N yee ride over passwalle tire TY you are ficing as an. XI
personness over the apringions of
some method of travel is less
Now a Manchester, England, res
tany has "gone title one better wided posturatic curbines in addition the posturatic tires. If the tires at provided potentials the the pretrautic time.

"toxue" of the treasers placed carefully eser it, the surfal top of the talei is teath is left. And if the air cushions absorb almotestia of this resistance, only one-handredth of the original in left. There is, however, nothing very original or new short the air qualies as used in a meter car. But there is accretting short the kind Hostroed—the sill Atyone who has need up air m Atyone who has used up air mattree-known how they give you the feeting of chine now they give you the swing or sabilities and strengs ground it space. The mettress is, of course, navier occu-picities indiated. If it were, it would couse to be an air mattress, in a sense, for the chief value of this investion lies

in the fact that when a little less than fully inflated it perutis the user to sink down into it, thereby distributing No. weight over a large ures of support custion in a nesting our year t do en samuratir shiresa The continue states have a nu nillers or relation of fairle halls tre-

hera in such a manner that the top side and the better side are attached in a finalist masses. These proved the great sidewise displacement of the contained all which is mentioned above. They are entimed with rulers which remit until





Electric lamp of novel shape to aid in the display of hosiety

A Novel Fitment for the Stocking Salesman

TRADITION describe that select TRADITION demands over re-when she begs how, shall run her band and fermen into the stretching stretching the garness over the rack these provides, for the purpose of verifihas its etractural targed ty-scided by another way of saying that metil she has looked it over she ban't ware that the stocking in free free rate and similar fame. But the shookever built parties lasty pleased by this serialize of exum-lation, since it is got to result in depage or solling. No there is now offered a mechanical arm for the regroses, and our which possesses a muri adventure. It is hallt in the form of an extremely long electric light tales, and the exciting goes right on it, over the light. One then doesn't have to held it up against depited for exactination— the light states right through the stocking and greatly facilitates the work of

Getting the Telephone Out of the Way LOS ANGELIES inventor of fixtures for leaves has devised a telephone sad-stand combination that gives



does not intrade on space of the room or half when not in use. This fintercan be placed between a pair of the wall stocks as it is but 15% inches wide, 4 deci inches high, and 4% larges de dat is the collapsible feature of the de-vice. The telephone instrument rects in a station alone on a shelf. Just below far dress dong to present photo directory and to serve, if desired, ne n writing days, while the lowest fro-ture of the device in the larger than that provide a west.

A Handy Bookmark OMETHING rather rest in the way S of a lookerst's capes to the utonic of the effortal eye, and is finetrated

It condets of two best-ade members, joined by a dist lift of metal, se shown in the picture. The smaller wire is in the form of a rined offe, and goes over the civil back cover of the volume in which the market is to be tood, the tortal barkbose of the desi Took, the torial backbone of the device lying flat equinst the later station of the crear. The happr who is a free-eat r Bp, and rillse over the top of the tops ich it in destroit to stark book in rised or this there is no slight ed tendency for the market to spring of. When not privally in operation the page olly lice life in the bank of the value then completely get of the render's

The One-Handed Screwdriver A BOSTON transferturer has bed per econolities that will resulty countries itself to many. Adds from performing all the usual function of such a feet in will held any sorre by its and with a firm grip, thereby adjusting itself mentclarly to meetines encapsed of small



The accordifier that doesn't need a hand to hold the acrew

saving and washing merbines, here ers, etc. reers, etc. The ties consists of a bellow shaft epraging a serredriver hit at one end, paging a memory to a manager in the red down the vester in canadral to the places of spring man which, when ev-lended, cover over the accomplisher his lended, cover over the activations an and pass beyond to enough the six of the series. When presenter on this and in released the even springs automat-lendit series out said from their test even. This izrection makes it one to place and nine across in diffruit places where the ordinary arrespiritor weight be prefere. It is non-magnetic and ever comity will with som

A Periscope for the Woodsman NATURALISTS and leather up really are interested in the Indian thing the interested in the resident risks belowing a decidedly new type of field about exploratest. The instrument Do right several mesons, and it is e sight around common are possible for the observer to breath. The use of spiked prisms in connection with the we are placed far out from the oppless, so that a present can see arrited a r over the top of a rock or heat The distance from exercises to objective

It is possible to use the tol first-lighted words, so large in the letine. The approfitation is 10 flan ex, and benters are able to identif detailedy game of leng verse. Nature and the helicant string telescope of portioner advantage to the ends of birds and attitude. The instructed has an adjustable triped, so that confined deventions out he made without nevesty of heiding the glass. A worker complex raw, for triances and tripot, is also furnished. The marring is un-lithat the probetting observe rame out horizonally, wetleally, or at ity injernedicte angle.



A New Product in Petroleum Refining A NEW office product has recordly A come and possible to be a large no in the window of personal This le un unempleus sillen produced by trivi-ler selente of subs (Substrates) 1810. estimic and and subsequently detroined ing the either hadroged elections. After delegateing the material is employ to 100 to 250 mest, depending on the parpood application. This product, which is called silica get, loss the property of lucing exceedingly large interedities on farm, for a given masses. Particles of the effect within the grains, are second that each all altra-altra-each rights take thru vidile. They are respond to be spherical in shape and the nathe-matical calculations on this back stee-than a rable lack of the material will have more than 2000 square feet of its troubled extform. The spaces between the spherolites act as capillary passages Any heste industry that has in its opera

tion the pretion of expansion to limits or upper out too, and not it tendenting to now, either get for that pur power. Silling get unto an a cuitabili ages that is, a released which, whill relative a give chemical resolute, durnot undergo a change livel. It has the projects of interprise (adherica) in a turked dotter, even greater than area slarge rarriest, and due to the high clean but enviolence it can be used in a number of processor where earliest rates that he employed. The permission latter to point more and more of ellies of terl. In gaseline adsorption plants and in the refining of petrolous products in steel of sold treatment. Silica cal retults all the speciencies by treand the sulfatir consesseds. Silve at to made from unterglass, which is test to derived from sund. The standard method of manufacturitie water-give I by fight fire well with ends and at number high temperatures, up to 2000 dr gree P., followed by cruebby, agitation in unior, and sedimentality.



Nature-lover's telescope that gives

Putting the Butcher in the Beel Fut Business BEEF for in far superior to latter for

cooling, and it is used alread ex-derly in the resunfacture of French The intelers, become, through there hattle it first purses, have not been able to take full advantage of its potential value, instead of being able to will it for mountains like 20 respe per jound to the julture mer, they have level disposing of it, along with other refuse, to the seap-maker, who has been paying them a flat rate of cornething like the cents a pound toe it. A suching in new officeal with which the builder may money the difference between union: and its prodice take to the statement that his pensonal new in York would offer a senter of \$35.6

per day.
There is an electrical bester in the have of the device which extracts the inter is still valuable to the sequentiar, or as to most all electionable edge The material recovered in somewhile to cube, and suggests obsensing arise in gen-ctal appearance. The total cost of appeaother is stated to the correspondence



Machine to enable the butcher to render his beef fat



who can't see without them

the marking to be less than appetited of pend, and it will hands fries 15 to 30 people pet hear, arrect-

An Experimental Road A BOAD of precise relationed one an experiment by the California. High-way Charabonia: In seder to study toolinds and cost as well as behavior in The processed was made 16 net wide and 6 inches thick and about bet wide and 6 inches their and about one sale was constructed. Most of the stabs taid are 6 by 6 feet in size, but two short stretches are of 6 by 9 and 3 by 6 shots. The visits are bundled by nems of lifting chains expecting in

bries cust in the sighrelativing ners and The side and mery than the cust-th-above encounts be came that ment be reinforced, because two subgrades, one in the custing card and one is the read, and become they regained a sund earthou and elastic joints. These forces increase the cost about ton diduce per cubic rund. The experimental road is to be subjected in a trefty largely consisting of hours

For Ready Valve Adjustment With the dealer illustrated the earn takes and keep the elementer per Early moters on the Irrariod dist reservate a thresholds of an lack, and by targing this with thursh and Share the proper clearance (tempily which thepsent(be) can be leatently made and contracts natitained as the rainer creaming middletted as the values gradually over into their work. In this way is entirely eliminated the rattle of way is emilesty eliminated the name of lane take takents. The adjuster is per-turnently invisited on the cur, one for each valve; and it is guaranteed to last the file of the modific likely. They are wid in sets of eight and twelve, for fagecolleges over and the sixes, or two sets of right, for an right. Their permanent location at the worl of valve trouble rackes it cary to adjust the electrone



A Cap for the Spectacled

FOR we in estames who we planes and in presit a diver to see rejects under water and at the moneand ours, an electr railer behing my has been invented by Depunció A. G. The cap is an emerged that while it provide the entoure of states. sikes the sware to breathe though

Caustic Embrittlement MAT never lightupe will penetr

coper metritivanto plate has less less haven and arkner ded, but the condition under which of endousies for some than. A recent investigation, as given in detail in Proper (fo.16, 3 pg., III) where that the free lydrogen returns the oxides and suitige of the haparities in the shed, penduring valle which increase the helploness of the material and, by the ferroughing of Kings of Native Junkets, assessed the exhibits stroom and produce cracks. tre-election, roug of which were higher that pre-ruly tool is treating water, although were of their were conquisited with the convenient seems while the

chapted engineering practice No More Builing Over THE carters little decies, with an Time of maker on it, defined from

the other and was tested with satisfatory needle in our own kitchen. It be Jaw a hirteriplated stamping with a small bale. Put in anything which is entail bale. For its proprinting women or being belief (tiles pero), it will present any belling over. It must be trained down the reverse of age porture to figure ties properly, for if placed with the edge furned up it will do the exact co-



Keeping the unwatched builting over Artificial Sili

OF the fear process for the manthe latted States—the Charletone, or nitravitales, the Posts or expensionalize, the Cross and Reven or viscous, others to production and the expensis median process has not with the great-red process. Artificial wife in East 48 haltstive of natural Allia as is compatible uppowed It is a distinctly new there with characteristic properties. The effects that can be produced with artifeld sitk comet be made with any other It is a observed outposedup of that to here to stay,—Chen. and Met. Hag., 31-70, 4 pp. 113

Chemical Silver-Cler

ERE is nothing specially new This deries, her possibly some of whit some of ou eller polishes which factor much drudg one. Easter the sid partiest the tarning in consider is not returned and the rea and people to purked in engranting and cultivatings. In the new way fill an unreal of ethicide size with lot water Then diswive to each gallon of water reached may of table selt and one table specular of ballog seds (bleach, of web). Place the allow-ricager, wires up, in this winting, The se diver is then placed upon the wires. In a few minutes the trepleh is all rec And remaining stains and discoon on a witness in the artist of cleaner that 2 is early to resome them



leasing the aliver in a chemic bath, with the sid of a wire trap

for the period a well-brock disc luiding sole. When the affect is taken out of the solution it allight be well threed in cold water and wheel dry with a well right. Orderion on caldined allwe in section but a tarnish construc-tally applied; for that resem exidized other straid be left on the elemen units has except to reservibe extra family If it is left on the wires too long all the dake vill be reserved

lodine as Fertilizer R NOOLBOH has recently been corried reey play an important role in self-facilitation. As with humans, where fedite has been shown to be an essential to leadth, only uditate arounds are ad-visable to produce good results; in fact, privately may be brought about as reads in plante as in bysams. Repert-terstation has slown that the application of about one pound of holize, as principal incide, per acre registed in an betwee of sleid assomiting to about one end a held tens of space beet per cree. See soit for homes find use Chiless allower for plant find any curefully puri-Bed of legior before being put on the market. It has been engreeded that if may be a nice plan to done the exaudded to suit or drageric water used for learning construction, as in better over to Aprile Some engineers believe that included of the adopte amount of lecture moded to attracted plant greath could be made to all consumertal attract from Chile, thereby enhancing the product for fertifier purposes at a negligible cost to the produces —Circu. and Het. Days

Doing the Draftsman's Me for Him ONE of the petry delays that makes
deathing a inspectabled testioner in
the investedy for countant shifting of the
gails—Tomasses, triangle, rits—from one position to marker; with the Secretly for twing a reposering tool of some ser-to Orterpains accurately the new posi-



Title, in ture, demands that the

drafteness lay down his yea, and every workered knows that parting down and toking me his toole is a rim ation, if he has much of it to do it the roune of his day's week.

A little desire is pure offered that does this measuring accountfully. It one sists of a wheel, negated inside the rules, triangle, etc., with its circumferlatter bad. As the trigger, let be say for definiteness, in sild along to over guide this wises rotates; and it carries around its edge a scale. He watching the disk go second one new just her far the triangle has been moved. With a Ditie practice skifting to the position of the pert libr became a very resid

A New Version of the Fireless Cooker If you don't believe that regaling a

weren that even one. It requires al-most exactant watching, and this is the case even when pas is pref case over when pas is post. One has a way of petting down and set when the cosk is husy posting the petators. One way to get around a large absent of the firmfayer is to buy a firstess cooker. But drudger) is to huy a firstess rooker. Bgit this countle teaving the past from the fire to the cooker, not to speak of the latter of paying for and keeping right another cooking unit. The thermolyne provides a way to get pround this site sties. It is simply a done-shaped load brutly instituted against the escape of heat, which is suspended by a claim over the top of the range and is easily open ated to a convenient lever. It utilizes the preshed-best principle for cooking regulation, storm, remain, pot reads, surps and shellar freds. All you have to do, according to the children of the Sheltpville, ledlage, mansfectorers pi tion gas mayor, is light the gos under the unstall containing the food, lower the done within two larges of the top, bring the find to 1 bill, loop it boiling a few saluties, then shift off the gas and lower the done. The best is now prevented from excepting. The find will cook on for bears on retained best.





An Optical Compromi

1 segs of object petament often need a piace that can be used where neither the magnifur nor telescope serve the purpose. If an oldert is too far away the taughtfer or reofing glass will not for if the object in not far except away the telescope is of too long range. The problem has been solved by the ininstaction of an instrument with which about the state of cut be brought into slarp focus. The "telemagnifor," on it is called, use deevisped in answer to the request of a propriated polymeter who was studying the liability of insects. With this motion sign he was able to observe their artists the without inflaments; then by his pressure. As most as the glass was in-troduced, took were found for it in other fields. Lukustories and industries are well represented, the telenageifer sucklar resells the accurate results of thermometers and pages in otherwise in accordic places, and the muridity of parts of markines at a distance telemantifer has on exceptionally has ratur, quickly odjevni varying distances. It is a prise glass. giving magnifications of free six to nine disperture, according to distance. Higher magnifications would make the field of

is easily used with one load, and can be corried in a neeter. Listening-in on the Human Heart THE possessor of the adjusting phy-tograph in list-ming-in on his our heart, with the help of a new poce of hospital equipment known as the stellophoto. This apparatus is electrically operated, as is stage-sted by the "tenvigen; or in second to the betteries. The throubling of the business rights to magnified three three by the instrument, and the deather set of listening-in phone is considered a great so-castage, enabling the decor and the public to consult over the heart action much more effectively than has been the

ties too small, Steel and compact, it

rating the Pies That Mother Used to Make T is quite the mode to call pencake



nightly shows by our obsturned. prenage make the extrape so believed by all pie fine and the outer edge is aborts speeds to trips the excess ofe creat as shown at the front of the air. It can

American Agriculture and Nitrogen Fixation

CONSIDERED broadly, there are three frequency before these fertifier can be unde available to the former. First is the perfection and exstudent of the airctings industry to a telat where it can revelop chess after gro, let us my, for example, at 5 cents ter pend, a figure that seems well within reach. Seems, preduction of chesp phospheric acid or its equivalent to replace the present loss-grade (16 per cent) and plessphare; and third, ellednative of all ben-grade plant food two terials from the fertilizer industry in order to cut cut the present encounter freight and hability core. Then change involve, on the one hand, rather redical deservies from newest starkee, and on the other, education of the thely. For both these research, for changes will come gradually as the re-self of numeros. compressed over granuity as the re-solt of incomes developments and mousic milestorets.—Clem. and Ere.

Electricity for Any Oven A NT oven may be enswerted quickly and economically into an electric over he the old of a dealer new offered by a Modien, Wis. monthstory A play is furnished which attaches to the we wall with a single serve; and a specially designed electric heating unit then is plugged in here. This heater seeming from any 100-roll supports ago-The cents is used to electrify fire less cookers, exampling costs, cluther dryers, water leaves, and all types of



Chromium Plating Chromium Pating
WHILE chromium plaining is as yet
handly a research phores, it has
been deny very noveredally. A good
current freely is need and the cause
quest have relater of hydrogen continually, evolved at the cathode apparently provides the conditions necessary from coldising back and going again into solution. Caronium pioting he here from to give protection in make come where third and other protection contings have failed. The election plate is hard and connect be builted on plate is hard and cursed by buffed or otherwise polished. This is more that made up for by the fact that if a pol-lated surface is plated the resulting chounts surface will have a period without further mechanical treatme The ability of elementum although to reals The apply of electrical budy to his number is ever excepted under certa circumstances by chresium-planed steel. There seems to be no doubt of its great

Silent Sharkle Bolts SEC maleries singuistrated; part, first Threshood, is a drein white of itely and permanently eliminate erroks and notice from lone shared for certifically "taking up" and tighten life these looks. It is unitake and endly applied at the end of the applicat, where the shockle is constaled. There are but Sear parts, all well designed and right reflect extent of steel-two cases, pricepare the into each other, is bean forther, and a blind branger not liefor applying, the cape are tiled with least grove. He should no the BBI of the shockle belt to the dedical street, a brisks is placed on the spring. This completes the invalidation and an further attention in process The tension of the speking personne of for free beening and takes up all sink in the sharkle assembly. The gives jucking large the whole drain Disting The par ethics slick here sisons beet both a segree



arkment that can be put in any over to heat it electrically of approper and up expense. The entry By this level, adding to the spore

f the out. Producer-Gas-Burning Farm Tractors in France WAR loss of 1,490,000 men killed A wall for not then that ther thesperi taired for active work has brought From to a resittation that the man with th he god note way for the naz. the farm trader-and with all erry of she-write farm murblery The labor-aving farm markinery. There-fore she has been helding an agricultural See she has been beening an agriculture exhibition and "welling" the lifes of units tour-likery to the Preside Sarmer The analogy of the French to make themselves independent of other countries in the nutter of fuel supply for ractes has led to some interesting the Some of the and delicenty motors. superfectation famile and antidoper-

This seems to b the paste practical partied of further taking vehicles on the Berrasent tion) size of the generator calls for fre-open reclarging if weed in used. It would be used for gas generalise the total neight of the everbrackless is about the wore on it the case of charmal, for the latter regulars about one and one produce the cast weight of water to produce the cast while the revision in the word is onthe audition to push all the fluid carbon, and no water need h with that made when presider is reaprated redoces the power of the motor about 20 per capt, while this reaches 30 per cesi in the use of gas practated from

Practically all these Protein tractor which exhibite gas made from word or from charmed are formed to centre & large and archaned looking postuce super of them, as illustrated in Le Genie



lishing the squeak out of the spri backle with a bolt and not of ner

On et. Paris (84:35, 9 pp., (ii.), taking up a bette convent of speer, others occupy-ter what a second would call outlease positions, that is, lunguag out to left or rigis. from or over on brackets, This sacribes to appropriate in Justified if a tage of adjectivity local to one numb factors of Frank charconiproduced gas not be taken as wholly accurate. Translated, this states, "Will yet pay 190 tonics to the American all King-or 20 trans to the Propris discreal burner!" This reflects in part the destre on the part of the French to secure
a fewerable trade building, and so see part the frame; and partly to a dealer to be self-contained in time of war. French tractor manufacturers are French truster restricturers are lawing a hard that with low-priord Associous compelition. They do not get as much tructer out of a given ansemi

of material as do the American numbers. The only tractor design of which we have no sulf-daring corresponding type orders of both rans and not see hear-In America is that of the countries agri-cultural and road tractor. It is a fourwheel drive affair, being two reages of service cuttings took served of about 15 miles per lour, and n-enal plowing is explained with steel tractor-type wheels for missing and for lea-seed harding and an extra set of rabbor-tored for feet prod-builting the recent French estill the short a determination on the part of the French to modernine their agri entiture as much as produke, and to pro-duce the meditery to do it with in Proper, both of phirth are landship mo-

her on the part of Prencheses A Shock Absorber for the Hammer

O to see one on prospering all One can go on waiting all day, on hard pervisors, with leather or even wooden heels that has been done, too. But the and it were a very planelike claim that the milder leffer will make the homnorthy easier, ley taking up the shock which true is framewhited to the hand when the blow hands. The rubber, he is noted, is curefully phone where it has



on for the a

Putting a spontaneous pastime of the kiddles on a permanent basis ne ef

to effect whatever in the wax of lighten-ing the blow itself; it slamply conducts the reaction. It lines the entire late in the lead through which the bundle a sace rapsed offer Otherwise the design of the tool is me-

A Change-Making Machine for the Subway the Subway
SERWAYS and other enterprises that

there is self more delay and more per-sonal bandling of their pareous than they would wisk, due to the necessity of unking change for those who came, exceptioned with the necessary nickel or ding. So the New York subman noteagreest has been experienting with a newspringing modules, and now annative to impedite involution. It, too, is note after, you drop your dime or quester or helf-dolor in the appro-priate receptach, and your more; is with of sender ridge, including absorpt at least one of the necessary pickels, is spilled out into the receptacle provided for the purpose. As in the form-tile sketmechbox, there is an accomposed whereby each colo demonstral is absent up, in the presence to the magnetise, ex-lorged and heightly Highdanted, as that

the spetter who may be in the crowd on detect the attempt to best the Exercisarion) contribute of these maclibra proved a completante vacthat you com't get wang trevplacie frot they will not. apparently, with every problem characteristic. The common of The powerper with Erthing vaniler than a bill, and the opwith satisfier larger than the western will find that no promotes has been

reclaim one will have to be sure of having pickel or aliver coins when one place to ride in the tale after the eight ation of the chance window

PURHAPS you have seen the boys in side old surventile show? Perhaps you love observed that the major difficulty of this sport in finding a sector held on the month surface of the value? Perhave you have seen the restricts relien-

nd lag sheet N. J. was all this, and it selved his investice mind to artise. The result is the "linker tunkled" Hustrated-spaces: The Life who change blood on the 2 die of this is due for a suspensating cuttings -then built a charer in the world of chaking him loose. Mr. Tinker bear, and fresh that the only 422 by in selecting the designed of the

other here to ride in it. Get Your Distant Station Tim A N leavester of Brooklyn has direted may be excepted with the dock on the expression as a expression. The mass can be torsed so that the can see at a glator what stations may be cought if they are houseworking within the couper-

for threates. to three each.

To get the ourset time in the 625 year valets or circle store at the time year valets or circle stores. The sale-tion before et after the best can be accretated by counting year watch. as all time charges are rost lours Institute. If you live it, say, St. Louis. you are in Control Tive Set time Soder at 5 obtains Central Time and that have the dial, which is metalf the plots.



the appropriate sist, and get your change for the turnstille

The tannedes on the dial e-gld be filled in, but are approximate for radio pur-poses. Then if it is 15 minutes after power. Then if it is 15 minutes after I at Ontral Time, it is 15 minutes after the less in all the other sones.



en the lid is down, a blow on the little lever opens it; when it is open, the aune blew cleans i



274771,7124000

A Safety Chuck

A SHOUTE projection against della A benefitar in claimed for the safety desire Illustrated between Our 160 graph of the laterier above the con plate to which the check is attached; the names outside this, with their little



sted inerts that fit into receives in t poute; the pin on which the pant binger and the spring that holds It in place. Arrest the whole, and not clearly dispions ring, which carries the spring. and which is adjustable to the criti size

moving the spring neuter or further away as the case may be.

In operation, the spring must hald the
part lawer in the recess, against the
netrifugal and tentional flore exercily the rotating check. As seen us it is to keper able to do this, out the parti the pawis cannot be engaged again with our remarker the dell from the hole before the drill will man, anything that would entirarily break a drill will site ply throw this one out of engage and bring it to a stop-

The Lid That Opens and Shuts With the Same Motion

WHEN the fundier inking pet is Whet upon, it dries out: and what it is closed, it is a great relation to upon it whether the same of the period of the same of rises it again the next instant. At Austrian insenter provides a circum and simple little mechanical arrangement that skettifes the situation. When the cover in dorn, a starp tion with the faper on the little lever will open it; and when it is open, another such blow will alout it. The secret lies in the little but that is seen about four-fitties of the way book, along the lever arm. This leg measures the function of delving member when the Ed is closed, at though it a smart blow is delivered the under side of the lid, throwing it care. But when it is already over, the ing him thin air, and the other leve out helded, delivers its blow to the re side of the open Did, pitching it ever late chard matrice



Cement Gun Uned for Rock-Durling Mines

R BORNT experiments, says Dat Haw thatins, formerly of the Harsen of Mines (Bulletin 20%) have been radio in a New Mexico colliery with a center gun stational at the make and of the gun stationed at the masks and of the main state. It spects a stream of dry state date into a strong variations current. The tents indicate that the shale dust was discharged at the rate of one too per hour. The solucity of the after current in one test was 800 to 1000. linear feet per subsite at the bitake and shoul 400 linear feet at a point 6000 feet distant. The dust rived at a part coul feel distant. The dust rived at this point way former 25 minutes after the centering gain was started, and definite evidence of dust artifement was found as far as ic cost activises the stops as tay as 8000 feet from the gas. It will be obvious that when the als

current that peaces through the entry being dusted in uniform, the quantity of being district in statistics, the quantity of freposited dust in moreovarity greatest mean the point where the dust is ejected. To obtain even distribution of dust through on entry, it would be accompanto shift the Guetter mechine from to time. In an entry such as that de-scribed, of 50 square feet gives section and 600) feet long, to obtain a deposit of, say four pounds per linear fast, at the rate of one ton (of 200) pounds) at hour, the mechanical distributes would have to operate for no less than twelve hours.—Con! Age.

A Bridge Between Heel and Sole THE assupported due to the a bridge with approaches and travers but to span. The device shows furnishes the span. The supporter complete of metal places which are secured to the shoe, as Wh, either by halls or acress. The plates held removable rather filters of rring brights to fit the fact, thus for ticking an excellent arch support. Many frot trentiles can be averted by this cens and it is risked that the life of

the store is phologord.



The Heavens in September, 1924

The Physical Conditions Prevailing On and Inside the Larger Planets

By Professor Henry Norrus Russell, Ph.D.

DOE accessory man to deput in many of the property of the profession of the professi

physical constitution.

The results of the physical state are dones than reclinary neck and must be said bodies, like the certa. But the hunter actes, and ingre, planes, are belles of the density, Justice, Versus and Neyture are all about as dense as the esta-faul is, they average about 106 times as dones as water; while Pattern is eith south but in a dense as the state-faul is, they average about 106 times as dones as water; while Pattern is eith south but in a done as the either.

The control of the co

A Solid Japiter? (tgt new cores Jeffryn-a wry capable

Both like corner Jeffryn-a-a very applier Lightla methor in countried justice—and raises effil more breven the durine. He raises plane were once lot, florer is no reader planes were once lot, florer is no reason with the planes of the countries of Jupiter's seriese, to and has been, only we hot as the outtle, a simple excitation absorber late, durine the billion or two of reason first their late billion or two of reason first their late billion or two of reason first their late billion or two of reason first which is the probability of late planes. The late of the countries of their most countries of the countries of their most countries. The countries of the Planes of the countries of the countries of the Planes of the countries of the Planes of the countries of the countries of the countries of the Planes of the countries of the countries of the countries of the Planes of the countries of the countries of the countries of the Planes of the countries of the countries of the countries of the countries of the planes of the countries of the countries of the countries of the planes of the countries of the countrie

among up 1000 that 10,000 septem, we can always a company of the term of the contract product of the term of term of the term of term of the term of the term of the term of term of term of the term of t

equatrial belt sistemen untived faster fines the cities, at a speed of some 250 billion per baser-orders were entrepose but in only about rates that of termierate company but in only about rates that of termiion the beats of the defaultingly prosperied; classifies theory of the winds, that this laticistum of optic of some risks 250 billion of Paylories amonghore. What the lever that Jackreya Chileviang set the both but not down thereughly and is odd owned. If the side for the Court hereughly and is odd owned. If the side is not exagged at the concept of the first about the company of the concept of the first about all the side of the company of the concept of the first about all the side.

A labor calculation of his-based not only on the detailty of the planet but also on the degree of oncontroller of the matter remark the center (which one

be found from the finiteding at the poles and the rate of midsta, shows that the lawns facts about Jupine can be executed for if it has a root each, of each; there is no be executed for if it has a root each, of each; the control by a first of waits. All on the last sole covered by a first of the last sole and the la

the visite surface ALOS side. For source, 2000s, miles in disastor, the review on case our HUNGARD in disastor, the lee layer ULOS sides that, and the strongber (See miles deep. There is nothing in these visitations, which we have in a probabilistic darks be proved as from substituting an event 1200 sides deep for the such leveral made source revent say, therein has the hardest in his

mathematical work.

There are established difficulties about the new scheme. For example, at the between of moves \$1,000 miles deep, upder Jupitor's ferre of grants, which is between the remaining would be facilities are the remaining would be facilities.

Treets, Sept. 16

At Fig. oblicks: Sept. 26

At

square lack, and under this common proseure belt aster side was wast to make down then mixed colnary decrementations. And doubt little-state of the state of the proseure at the bestine of the state was consistent to the state of the state of the wast consistent to the state of the order can write ourse of all these begins a six of this order can be, till prosecutarly discuss them in detail have been shall it is of great halves to a rate to be sentiable the low great in a six of the state of the state of the low great in a six makes a normal methods were in the organt in a six makes a normal methods were in the

The Beavers

Our map shows the appearance of the beavers at the
term meetined below II. If one halfs it right over
life beed, with the public of the congress it their proper

we like head, with the prints of the recogne is their proved directions (title explains to recovered of the entirery directions (title explains to recovered of the entirery of the contract o

e bettered. Pegense is high in the workered with Crizbring and Aries and Tagrass on the left. Argarities sis Chapterians are in the work, and leave down to the Swithern 19th. The planet Mars, for Middler field have then entrything rive in the anothers which, that or four than entry the properties of the limited of our map, horizon by September II will be in order and of the leavests.

The Planets Mercury is an envalue star when the month beg

hat is directly providedly out of orders. On the 10th by prove between reason the sum, and the stress this directly are as a melling star a new to see in time. On the 20th by reaches the provides the provides of engagine. If $\Omega_{\rm eff} \gtrsim 0.0$ and γ which is largest of the preferring promps. The is uniterally highly, because we prove the sum, and should be visible as a star of the next magnitude, fring when 4.20 A. M. Tentra's in normalize state, at less the sufficient the sees at elementation on the 10th, and four those as leight as 10th, or mostly shoth those belief the stars.

as Blats, or mostly eight those, brighter than Jupiter. She then about 2 A M, make a stong shadow when thinks through a window upon the opposite wall, and is welly wishle to full dayhold. Mar- as just you expection, and is still Mar- as just you expection, and is still.

state is just you exposition, and is still the play of the centility do. Though het quilt so have and found to it. Accounted the control of the control of the detarge interesting from 50 or 40 billion geller, and his helicitaters arranged appairs. The observations of which we walk had north will be arrively control of the control of the control will have prehaps the host exposure will have prehaps the host exposure of all the control of the control of the control of all to one the plants with all at a con-

Jujáre is in gradutire, out of the sun of the Ja, again rate to revisional as an overling size. Feltz 22 degrees north of the equate, in sets, early, hand \$6.55 in the middle of the north. Nature, is an overling size in Verga, within \$6.50 P.M. on the 1st, and 5.50 on the 50th. Centure is in equation on the 12th, and the properties on the 12th, and the properties of the 1st of the only for degrees sentia of the equationgration retail has he has been for more present or the 1st he has been for more

than 30 years. There are antertumory to make a support of the strength or side to still see that the side of the collision period to found the off the collision period to found the off the collision of the coll

As motified were and No occurate worth per day. With great tolorogen be will be threewing to observe at this opposition, for we are very more the plane of the equation, and the satelliter could be our passing from able to obly, altered to a morth and south the, instead of deciding about him in Not-Ollivon we have wouth, never to do. This is also an anomally profit these in accurace the failurable of the plane is the poles, let observables of other cases can be attempted, will will be provided to the contraction of other cases can be attempted, with very term internation.

Negture is just part out interior, and rises of \$ A No. the widdle of the negtin.

de eating away the sur-of metals in order to sprotees thrown a design.

practiced for a long time. The old markets, Rendered it, Rubers, Rendered it. ty others did a great deal of work along these libes and developed the net of circles; ascal to a high state of perfection. Today the net is practiced by Jessiers, manufacturers of Jessies and gold and silver wave of all serie. There is warrely an article made of any metal that council be riched and is not either in some singler in order to enterior its engagement.
It is interesting to note that the word effecting in derived from an old Dutch word, etces, which literally sected from an one listed word elses, which littening needs to est. This the art of etching applies the application of more correless lightly to the surface of special as as to est out a design therets. There are many different substantes that only be used for this surney, and their rejects a describe on the sectal that

he to be worked as well as an the method that is one played in eaching the seeign. If is underestablishe that

the acid, which will seek supper perfectly, will not eith mid or that brane, or year not have any office on after MANNE. Plante and two contents concessors of stebles. In 1886 There are two puteral processes of stelling. In only, tentral angelts only are employed. This is fisheren an obsculed eloding. In the other the electric current is need one and do the chemical. This is estilled electro-lytic stelling. Chemical stelling is of two kinds, swited and integra. In relate stelling he of two kinds, swited matter than the surface of the metal. This is done better than the surface of the metal. This is done with a special, acid-resistant, valuable or gass proper tion, which is political over the surface of the meta The root of the metal is left abovered and is quen want by the sold, heaving the design in write. agtin exching the entire surface of the metal in correct with the varnish preparation and the design in cut lifes the sense with the aid of a fine test, which cats away from the insulating owering and exposes the metal undersorth. The article then applied to the surface and the dream is noted into the mose in the

eater of Integlio work There are many formule for making the suching regad. They all curtain some kind of ambalium. It made from fatty and

offy marties by a newest the way as superification. The olia, fats, greams are treated with examin-seds which exerts a chemical action of the forger, convetting them into soluble alls, that dissolve readily in water. which is the taker given to this process, is simply some crucks of lawfable streets me 2000 a paid salutation with estimic different amounties The process of consensiting consists in beiling ut the first and greater with the quartic seds, or lye

eventuating the solution obvious mettl the man it ready to set and allowing the serge to solidity in large names which are then cut into proper sized cales There are various other stope in the process which need In order to preduce a way which is free from exceptioned countries on great our is taken to said just the correct assessed of the reagent which is required to cuttides with the firt or oil and occurr to into a When this is duty, a more in obtained which dues not contain free, thut is unounbland, iye. The imperance of having a wan that does not contalk free lye, is entired when the action of type or capel on the substitute fact are washed with man, in taken into ponoideration. Unpetic soin has a distinc-tive effect on the lensus skin and hair, the sillo-

and week, country them to tender; that is, descriping their laberest stretages. The life or leader of the fairle is also distrayed. This clerateal has a less pates on the way table flows, cotton and lives, but if present to difficient conventration and if the clothes present in Albanda expendention and if the clother are wested often enough with a map that commins considerable tree live, their strength and finish will also be gradually destroyed. (Chaptly sade is the reagent that desirage all animal matter, t TO SEC TRIME MUST IN the market that are free from bye; that is, they do not contain uncombined by

lein in added to the solution the characteristic red mice reaction, indicating the presence of free alkall, that is rearting, indicating the presence of free assets, may the lys, free not take place. But, when the solution of the scap in alcohol is taked with natur, then a distinct and coloration in produced, indicating that the in-

This aversing contradiction is easily exciptoral in-

SCIENTIFIC AMERICAN

How Metals Are Etched ri, bitmen and the Bie. A good ground can

prox. Insures and the Bis. A good ground can be under from these parts of wext and fore parts of supials. For special purposes, as in copper suggestion out the bits, weeded existing around propagations can be exclused. The programtion in patient on the surface or the it may be raised over the same with a institute covered raise.

The stable fails are that of some bits of some life. ather-covered rather. The stealing fields are also of many kinds and meny

The event state are the or only little and testly different compositions. Arida such as higher, hydro-cliants and softwar, are employed. In electrolytic estaining on add its not employed, but the article which is to be sorbed in covered with a vicinish in the usual manner, and then issuespeed in a back of a soft which, when the current is pussed through the both, produces an acid which is the correct one for eating the design into the notal. Thus it is to what the some electrolrie in according with the nature of the motal that is being worked. The results of electrolytic obeling are surviies; and in cortain ways much better than those that are obtained

the entitudy chesical invest-The Hardness of Water. What Causes It and How It Can Be Removed?

How it Can be Removed:

THE landquant of the bowests, who have to
A wash fielder and delive, know with these
retainer of land trater. The eighter it also contraining of land trater. The eighter is also contraining the contract of the contract of the particular
bit can be a supplied to the contract of the particular
bit to the landstried processes, particularly in the
huministers of herties, solve publishe, shoping and
facility trates facilities, solve a said water is essential
to the recover of the process.

White is level for natural rescript and whan in the
"Wire is level for natural rescript and whan in the

Water is little for instance requirements and when in the corres of circumstances it biguess that a hand water is exceptioned and must be used, because there is no other analysis, there is nothing left to do not in use it. Fortunately it is possible to recover the handlesse of water by shappe chemical means, which can be applied by the horsewide and inputing many which can be applied by the horsewide and inputing many and and who for the department of the contract them. by the chemist or engineer in the industria. To understand how this can be done, it is no

A Soap Free from Lye rr there is a necessar which is known as bedro

Obtaining more at a possess water.

If the said is made up of a weak has under the water.

If the said is made up of a weak has und a strang seld, as of or amough a first said with the water, of the harder of the then the squeeze solution of the solt, nothin sulfate for example, will be perfectly neutral. Soup is a selt of a fatty sold, where olde palastic or structe, and practally a mixture of the three, according to what sett of new material was used in the mate-facture. Three acids are very usual, while the 'alian'

rection. These pages are very weak, while the alread or how that is employed in the reaction, addition hydroxyge or cassife sods, in very strong. The result is that the perfectly handral song, that is, one con-taining no free, agreemblered alleafs as were as if dis-dictions free, agreemblered alleafs as were as if dises in water, liberates by, which is readily det by the characteristic phenolyhibalvin color reacted.

A test was made with five different stage. To of these were tollet maps of variou, grades, one a castile map of the highest pority and the fifth the new product, known as the lysion step, developed by Dr. Marries Alone, well-known committing chesion of New York City. Pro- bestore were used and a small succept of each Aup was dissolved in a little water and then the vol users of the sciption in all the beauty were made state a drop of a salution of photosproserre. Bvery one of the seep solutions to make a deep pink with the case of the seep solutions turned a deep pink with the selection seep. This test recognise of that made with the below story. This ten beforeign that the hydrolysis of the four other man Individual that the hypersymbol of the more other mays resulted in the formation of first shall which was formediately and magnificantly detected by the plensi-phital-ion respect. The sevent of alkali that he th-erated in this manner is said to be from 30 to 30 per

out of the weight of custic sods used in making the out of the wagn of custors one used in memory me money. The third has belief below way in a way find from not extent, any five class; and that form such liberate from a stand disturbed in water. Hence, such liberate from a stand disturbed in water, Hence and liberate from a stand disturbed in water, Hence and washing with this ways, as the note indicated, as skill in released. The harmful effect of alked it washing is consum investigate. Alkell possesses the power of waystrings the elic facility in the consumer in the power of waystrings the coll facility and any power if in

and operanent Lierbane. The presence in Temporary harbane is custed by the presence in water of a sain of calcium, known as calcium Hous-boars. This solution is switch to water and who such water is used in vasiling clother, the saip of saints to firm a sector laterist of thiny sain who, the water is soft. This film naises it directly to cloth dishes or wast clothen. Constituting the exploration is that the colcium wasy, formed between the subble cal-cium composed in the water and the way little of the say little of its directly constitution.

and completes in the water and the body it soluble in matter and forms a precipitate. To remove tamporary hardens all that it is no de in to hold the water. The calcium bigario To remove imporary incrines th cost of the following increases in the first to built the water. The cuiding highermans is decomposed to from an inscribe substance, cuicing cardenars, lineaton, shall. This settles to the letture of the water in which the houring is done and the transit in which the houring is done and the cost of the water in which the houring is done and the cost of the water in quite soft. Now it will yield such such with soap and can be used for every purpose that water which is inherently sett can be employed Percenter hardens of water cannot be renewed by siling the water. Hence the significance of its name builting the water. Hence the significance of its name.

A simple changes process girel be used to descrip the
permanent hardness of the water. The substance that persussest hardness of the water. The substance that is responsible for the persussest hardness of water is known as substance of existent. Sometimes suthers of magnetime (Ropers and) is the course of persuasees hardness. Both these substances are soluble in water and when reason course hardness. Both these substances are soluble in water and when reason course hardness. Both the substances are soluble in which water and water water course for course with year water water water water than the substances and water reason could be substantially and the substantial water w makes washing ciothes with the water a very labori and difficult metter.

and difficult master.

To decray personant hardness of water all that it is necessary to do it to add sufficient sods to change the suffice of calcium or magnetism into the care house water is translated in water and precipitates to the bottom of the suffic of the suff. The water is rather designating and by this treatment. No matter what the color and by this treatment. No matter what the color latter of charded powers of the water actioning agent may be, if is the soft content of the same—and all growning contain audio—this determines the water actioning powers. In fact, generally most effective and economical results can be obtained by today consent ands directly for water adopting.

skin and the bair with the result ti side and the hair with the result that sher washing, the side and the hair red hard and dry, that render then tender and brittle. Frequent washing his that effect, as doe nor and others who wash their hands many times a day have sentified. It is citatered, and the citates are substantiated by many settlesseds from physicians and others all over the country, that the lysices may does not lear the side to matter how often used. The lysices may if the Mantire Aless is made in an anassal manner, but the appendication that it curred out on the raw materials is of a modified nature. A product is obtained which looks like ever and acts (Or

but which is not really some as it is conceasing soap, best which is not really soap as it is conzoning inswen. A test made with the lyviews soap to deter-mine its elementar power clearly deconstrated that, it will return did to very effectively, that in professes ent-siderable scale even in hard water. It does not had like ordinary soap when weaking. The hands rubbed with the ways laws a not of a resury feeling and with the ways laws a not of a resury feeling and the map does not said at once, but creame and with more water it produces aluminat heavy saids. This action is

the many laws the end of ourse, but received with his properties by the first law may be the first laws and the support of the laws that the support of the laws that the support of the laws that the

shampso preparations. Not only does it through cleanes the hist below it is a set, firstly condition for sharton, too, the boiless was performs very we for sharton. The boiless was performs very we took as for a boile of the state of the state aboving operation of the state of the state of the state of the state of the Dr. Alam. has bown riserly (Smittled with sever important cleanes) developments, to the capacity consulting cherde. He has done considerable work to past on the problem of producing putables force

The Service of the Chemist

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Patching Platinum Dishes

I has been recommended that gold be used as a solder in patching plotings emperating flates. For this purpose a piece of the gold is beaten out into a sheet of approximately 0.1 militrates thickness and from this sheet there is cut a sirit about helf a millimeter wide core had imper than the crack in the disk that it is desirous to requir the data that of is insured to report.

Then the dish is held in a position so that the betten points operands and the strip of gold is held right on the port that is being repaired. The plotters is that is settly repaired. The purious is then beared with a blast lamp and after a few seconds, the gold melts and fills the opening in the disk. For further details the reader is referred to Militi-tion. Lebensuitedance and Hudene 1923, volume 14, pages 202-6.

Effects of Tannic Acid on Concrete IT is well known that certain organic seen the strength of expense, and a case is on record of a concrete fiveling failing ewing to the continued action of super. e recently a study was under of the effect of teamin on the strength of concrete, famile being taken as typical of an expanie substance. For many types of concept mixings, it is shown that even less than a testile of 1 per cent of tennin on the weight of the approprie will materially reduce the strongth of the concrete, twis being usade over a period of two years. The oction of the tennin appears to be in some way deadent upon the size of the approprie articles. The results obtained bear out these already known with other organic will

states, and from the practical standterributed with cognitic importation is not to be recommended. Incidentally a test about its made of the availability of made for exercise menufacture. To A textre-same mellette bettle is filled the four-cases mark with the sample and then a 3 per cent cannot need solu-tion is added satil the seven-cape mark in reached. After well shadou, the bettle is allowed to stand for 24 hours, when the color of the Equar is noted If a dark color, the send should not used for high-grade concretes.—The Chemical Trade Journal.

Simple Test for Boiled Oils THE following rest for distinguishing terment a crade regulable will and one that has been hont-treated to give in the Brone de Chronic Industricile Moreh, 1804 A reagent is used by dissorting one cable centization of freshty distilled inti-line oil in ten cubic consistences of ourthan off its ton cubic continuents of our-bon netra-thicetist. A five drops of a substitute of broasier in earbon nemarkst-ries are then added until a white precipitate in the network. This white precipitate is then redisorded in a elight excuss of the scatter. A few drops of this reagest which processes a slight policetals calculate and added to the call that is to be an are modern of the culture in the co-marked. While it belief of such as boiled Ensted all, a drep brown colora-tion is broard, whereas with a crude oil the color is fermed. The furnation of the color is ascribed to the percentife

off, and it is eaganted that a reaction

station of Water Piping WATER piping to well protected against from according to a first nen poset. In coording the same with platted straw rape. Knowleake perpara-tions were found to be unestituble for

New Sulfuric Acid Proces THE Schmidd process for making brouge it is designed to work efficiently on games of variable or very low saids Shalile contratt. It respings the familiar their old as validity upon, but di-press with the chapter, for which it efficies merbagical ments of sector ing thereigh and latinuste regiant be ing thereign and initiate refract be-twee gove and reagent. A revolving draw, disting into the articlesia, nes this and expensity reserved files of seld to the gas stream, which also of and to the gas street, which the browardy reason it related with the last hard. The reasons is offered for the treatment of power as his in suffer display as 1.5 per cent, and in experience to expli as five tran of sold per day, and is designed to produce any excentile up to 60 degrees Datased. It may find complete the transition of the contracts of entiting chamber plants, or us a substi-tute for them, but its special appeal is the metallingset final on material other than softer and whose farmages are not run price

A New Motor Fuel A COORDANG to Arrest of themselve floor later best put out on the market under the the reduction of carriers expensive which is obtained from enlighty waist gas and which is subjected to a pressure of 150 which is subjected in a pressure of the atmospheres at a bemperature, surging from 400 to 450 degrees Centigrade. In the pressure of a catalyst. The encayed is made of loss filings which are conered with a centing of patentine cur-bersie. Nysthel consists of a ministra-of low externion weight neith, nicolais. aldebreim, estern bedreserbeth etc. It

Gratie contest.—Eming and Mrteiburgs.

cluived that a printing of spatial and Motor Fuel from Rubber IT is reported in the OG. Power and Dwg Experier that a rhandle work-ing in the rubber plantarions in the lig in the nibber pizzizitone in the Pedersield Makry States has developed a precess first the extraction of an oil from rubber every. This oil, it is clustered, may be substituted for position

as a motor fiel and also is used to conbut conquitions in the place of petroleum Removing Taste from Codilver Gil

A RECENT discrety made by a Nor-A region elimist has made it pre-side to resove the disagreeable made from codiner oil and thereby make it estable for the in a variety of find products, including its substitution for the products from used in the manu-facture of margarine. The process in-

oil for maintention, in edition to specby in an exclusive peer field for this law rt of the end felteries, as indi-

New Krypton Uses THE use of keypton for electring radio photographs has been revently

It is supposed that note suggested. It is suggested that notice with lifets molecular socials (lifeterally orbeate, bottom sublistes are two le the five the stage of the live to feel out taking of rails phriographs, with reger. The absolute involving of keys has fines the election point of the plors it is superficitly over the selfs of bhough or legion, which are near dif-

Thermal Conductivity for Gas Analysis N electrical method of gas multiple A secretical meters to per security perfected at the Barress of

Sundants of the Department of Core nette mars modifie the immediate detion of the chatge in composition of of early changes throughout the day, any the material of authoratic experts of regulating appendix to acco gas corpodition titler industries in abid the new nativel is expected to year until ure the muniforties of the passeducture of subgate acts, and of exprisely assurable, stel thcornection of helipsy from natural are tor aw in ballions and similar. Fork-solver Paper No. 28, Itares of

Electroplating of Aluminum A NUTTION of electrophility of about A ages, which was reported in or estimate defined before the American Deringiaters' Swiet, is searched to

eller being sensigh-leashed with a sterlead, are first suspended or stocks to a solution of politics hydrocalds of about two per cred storagile at a temperature of from \$5 to \$5 degrees (legitization and a carried of about 23 angeres per equate fact to allowed to flow for 12 minutes at a voltage of 28 to 36 volts. They are the transferred to an ordinary country castie but, and are placed for th ndrates with a current of 25 suspenses by is finished in an ordinary said owner salfate both in the next residen

Extinction of Fires by Liquid Carbon Diexide A ISSPERT from the Melke Invitete r estlaring of firm in mites by the of liquid curters district. The results have not hern were concluded, as worther they were not in the experhaps they were het in the ex-perhaps which were and at the Midde Intelligin, curies disable from clinies was distanced into the miles the arm on the being instated by leries streptings. The offset of the carbon

domado in to prevent insuced leakage of

so that if each point of govern indiced possible the rate of an equivalent value of six, the possible of pagets 900 R. T. U. is provided. After all flowe was railspointed, water without delay. The results of the ex-periment show that carbon dixible should be used where the free on the sentionality modeleted by stopping, we that prohibitive assessment of gas any mod estimated. Further with the use of the gas, a sacing is effected because the tire of the mitr due to roof falls.

sic, is personal and less coal in Oxychloride Cement Tests SOMPARATIVESA for news of o COMPARATIONS for sector to with it. Eve seems arrist and bribber, examble the rement next

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Dried Yeast As Supplement to Good Poultry Laying Name (ferry the birds are pen) of

TEX jets (ferr) the same jumps. but for the authors of and and any mass with and without artificial Egico-Riesettical matheds were med in in wright, rgg production, sine and welp of our and food intake. Practically algroups, revelsing tend, should a re-agence, although in some coses the dri protect, attention in many rows the del-ference were not great. When pulled-terry exhibited to house feeding periods by the use of electric lights, august differences were obtained in favor of the While on the subject of year it will

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E. Tick St., New York, N. Y.	Vanter Case-Barks connectments for	hand writers in evert reporting, prescuting a fresh writing serface without the turning	utilized to a manisom degree. Patent 1427,- 321. J. C. Londo, 982 No. 210 St. E.
AND LANG COSTAGE STORES - Which will	a powder cale, rouge, a loy stork, and means for applying the articles. Patent 168675.		Coner Hapita, Iowa. Comer Is which downle are used to se-
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an ordinary lighting retruit is employed for settesting the device. Patent (404419 S I).	Wyo.	Executes Salashie for ettaching to parkages as that both may arrive and pe-	novel made of langing and arranging the construction. Parest 1407517. L. Lane.
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trical evolutions Paper H00417, O.	Roard therefore. Patter 142225. J. W. 2020c, v/o Holl & Surgert, Red Wing, Minn.	Concern Micro-For use in economiction	other reservelys. Patent 1497249. A. H.
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and he'll do it at a cost of from three to seven cents a ton-

cent for demurrage, and you'll never have to rustle up a gang to unload your coal. The small cost of a Gody and the tremendous amount it Ant for Bulletin A-22

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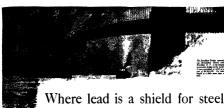


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bridge with red-lead

The engager currectly estimates the

stresses and the strums on such a struc-ture. He specifies steel of the proper tenule strength and dimensions for it But from the time the bedge is built, rust seeks to destroy it Lead is the shield that protects the

steel cables, gardens and beams from rust and prevents the bridge from be coming a death trap. It keeps the besige strong today, strong tomorrow, and for years to come This is only one of the many ways in

which lead constantly series you and guards your safety. You do not always see lead in use. But as red lead in usint you see it on metal auriares everywh Red lead is the standard protection for ince and steel It is used in its natural crange red color or tinted to dark colors Nearly tweaty author pounds of red lead are applied to metal every year in this country. Yet this is not enough Rest still destroys militate of tons of steel Between 1880 and 1920 the world a output of you and steel was about 1 800-000 000 tone Of this total it was estimated that 600,000,000 tons were wasted through rusting in use Just as unpaceted houses decay and crumble, so non and

are soon ready for the serso best Where red-lead saves metal Whenever man and steel are, there redlead is needed to save the surface. Spe-cial care should be taken to cover with red-lead trop and steel that becomes to

STREAKS of red stand out against accessible for punting after erection.

The sky Tiny figures surpended in Railroads in the United States use modest cover the steel cables of the red lead to protect their bridges steel. miling stock and steel structures. Gas and water companies put red lead on stand paper tanks and gasometers They have found from experience that red

lead protection lowers the cost of man taining you and steel structures

In ships of the United States Navy and on vessels of all types, red lead



ards bulk cargo holds coal buskers chant lockers all metal parts of a ves sel-from determination due to exposure to salt and fresh water and varying at steel unpertected by paint, rust and enc constants

Bed lead keeps rust from attacking metal roofs vicam radiators, regulars paper, fire escapes feares, area gates and extenor ornamental work of all kinds It covers markingry trucks, and paper and metal equipment

Red lead has been used for groen hous as the standard protective coverns for metal. Moved with none innered of pure red lead makes a paint that dries to a hard, touch layer and clines turbily to a hard, tough sayer and categories of to the surface. It is manhable in water Red-lead should be said in usually used next to the metal in its natural orange med color. It is tinted to dark colors for

finishing costs for the sake of appearance or for unspection purposes

Dutch Rou red lead is the name of the pure red lead made and sold by National Lead Company On every keg of Dutch Boy red lead is reproduced the porture of the Dutch Boy Painter shown below Thus well known

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white lead inseed od, flatting oil babbett metals and solder National Lead Company also makes lead products for practically every purpose to which lead can be put in art industry and daily life If you want in formation regarding any particular use

Further information about lead We have a special booklet Protoction of 'Structural Metal' which we shall

of lead, write to us

giadly send to anyone who is interested. This booklet contains information telling when and how to give red lead paint protection to structural area and steel If you desire to read more about the use of lead, not only in paint but also in many forms and for many purposes

which will surprise you we can recom-mend a number of interesting books The latest and probably the most remniete story of keel and its many uses in Lead the Precious

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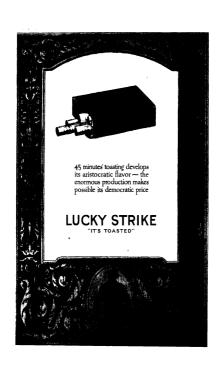


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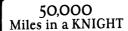
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IT is in the effort to owner such appear-ances that we present, in this bear, the story of the dight so for as it cut be taid in his August. The two surviving teld in late August. The two surviving planes have reached a very critical plane. They are waiting in Iroland, expecting almost daily to long off. They have much almost duty to top off. Its mer more one attempt to do so which failed betwee of the excessive load of fast which they were earrying. Duty bulletins of great learth proper in the newspapers, which give one the increment that the responsi-ble efficiely in clearer of the flight are obling in their own minds about the next acquitoday planning to send the pingen clear to the west count of tables land, transfers deciding that after all is leading can be made at Asstrongwith of the jaw-breaking towar on the east resid next day again revening themselves. Meanwhile not story is in the compassing roots. and our last chazer to bring it to date Application is a gift of the agent as tong We loop that the events of the pend. We hope that the events of the days following its final departure from the hands of the compositor will not sent-cualy contradict anything that Lieutenant McDarmest has said or that the editors

O's our thing we may be some, however, Begindless of what happens to the places after having levius), the flight is pages after setting treatment man in this townest a trape technical success. The big part of the fine is belief the aviators. If they are but fortunate enough aviators. If they are har fortizate enough to find a lauditacylary somewhere in Greenland, the enterprise must have a successful edition in Sentile some time in September. We might even hope that in September. We suited even boys that the final landing at the shorting point will coloride with the appearance of this lesse. We have been singularly fortunate in such respects before. Several power say, shift we were still in needly, we had the of eight more access on our coose during the course of the winter. Every one of these pictures was nesigned to its-lear weeks in advance; every day of their appeared on the newscands in the midst of a blinnerd of greater or less propor of a binard of guater or less tropes tions. And no inner say than the se-tions. And no inner say that the se-spring, any owner sharing the "Stendar-don's" averaging comparisons, and to the Nebestry inner in November, made to public sponsance with the day peess was full of the kgs similarly with \$200 are not full to the large similarly and larger areas November 10 are cultivated to the public of the larger and the second public of the larger and the second of the larger areas and the second of the larger corr readers that the details of our work, and had send appling about our work, and had send appling about our

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A MONG other features of the present series which marks a new departure, in that it is the first time we have gran out-side our own stoff for the trainful of that series. Mr. Kelen is either engineer of a company that manufactures traffic markers and signals of rarious discrip-tions. The policy of this community more to will may of their goods tgatil they brown to their lang to make goods upon their are estaded that the two is not merely server, but conditates the less treatment of the tradic at the point where it is to scour. This, of course, means that one of the principal things that Mr. Keley, and the seed-unit, do in to become us and down the country examining the spec-or which traffic is sufficiently center to denuted regulation. The treatment of Porture arriver which by describe was there with his conveniention, and the story comprises which an admirable expression of the exis scuffe problem in all practable glad Indeed to have the spacetrality of prescribing if to our readers. Mr. Keker, inchessally, plane to subsult further mubecaut in neight to will get a titule Not further away from the things that he has been able to do, and show to sense of the tiltings that he would like to the fet

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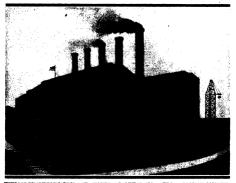
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The Details of the American Army Aviators' Experience, and the Lessons Learned

By Lieutenant Corley P. McDurmont

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a specimen and was freed to lead sheet to present Wheelelber For the artistore making the flight, the Journey has For the avalence matching the Sight, the porties has been self; as termentokened, how "cross oversity" ring. Note of the loop has been as long as the non-stop transcentificated justice; made between New York and Son 10cm, by Licenteceurs John A. Mucrosity and Onkloy G. Krily. But the last manual ordinons for through a trapenste climate and over a country where atomic are not very prevalent. Quite the opposite has been the flight around the world. on the light around the world. When the world flight was organized, nobody know

what would be needed in the way of supplies and equipment for each an understollag. Of outree every solutor lates that the stryl-time would need oil, gas and water and it was goneed that agare park would come in bundy at out of the way places around the It was also known that names securities being as an electrical that there's equation that themselves out and new ones have in be invalled, and that rough landings are becomed in mode at these, during which

wittee get crampled, and spark plags upresistedly quit sparking, and in fact it was known that about fifteen thereard flings reald go wrong with a big sirplest As he revolves 'round-the-world exp eter misted for a settern, the only thing to do was garee at the things that would be needed. From their experience on such legan to gather equipment for the air planes to carry. If all the things that weld layer been needed and were reconmetaled by various projects had been cul-lected, such alleptons would have required the country of a large-stant freight out metation to six in the rock pits. Upon this impo list of filtings that tright have been needed, a pruning process with undersated and only the last arrange things were included in the final arrange ments for builting the simplates. The hearlest confractal was sett about 16 bearing septembers was sent assess of streams to the various stops and it was based that if the motors give truelie, regular world be taken from the bear for repult. Filtern energing liberty motors were 'platted' around the world

and it so happened that whenever an ex-I'm nation was product, one was not far

in their attempt to diregumentate the girle by africate. It is not known that now our go place others more manifers ration legis to go, but so persistently har wieter noricel at the terfo tion of every Diserve Cyper night: Baggar competence in for the Larry right, Band peakling place, a street sid to since it discussion the positing of the in Proce hand-bank sortise of travel that hen which up Building the big world craisers under the supervision of Army experts

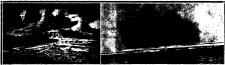
models could up to the near standard.

Use of the chief papers of the Fight
Around the World are to test the could.

Armed by Weld and to the life region was the second of the



It takes more than mere simplanes to make a long flight successful. Here are some of the things that helped the American army flows out of rought the successive of the flight



Right: The time please that got may the differibles of Ababa, acrosing at the Kon banks. The forcet method has model and account a boundary

of the Air Service, tells the story of the way down of the Air Norsics, tells the story of the way first mater to go out on the world flight; "Propul date two forty filtereth with hole to result car comes fatied four short comes anchord comes speer night in only period Mountight calls cold period empers serioed five thirty ass Hall easer her

and was beening at time when sighted as sected find used all our signal assumption period Starter by-to-enbelokes if anchor dropped." A few days later a Court Guard cutter stranged into the log with a new major for Major Martin. It had been placed at leath Harles for he said surrequely. The

Harker for Just seal sucreaselys. The above triegram means with librar of equip-ment. "Bits in employee"; this is sea-thing that must be eliminated some day in styrious movers. This needless often largers, always park an entire test of exceptables, and be one of the fruits that make internal evaluation engines with their complicated pistons unentiable for airpistes. The Mojor Spott the triple to airplanes. The Major "agent the might to the ship"; several nights were specific the aviation in their "ships" us the affiplanes are often offird, and future air-

plates making such journeys will be deald have more farilline for necessardating the error than the several world cratiers of the nic, which have no place about to day occur the subtill "bed their all our eight amountable," only tray of eigening from the simplese new to fire a Very ploted with a wholl that control is medical and on this period will no detection factory Improvement on this motive will no death in

see at with the narrow edges toward the observer. Billes, phoods making a head report, or some sett of a ber should make better signify severling to the

Note one of the nitylates earted, in a specialis

Arts our of the impasses service, in a special per-sented log, all the tools and mixes equipment that the weaks world stand. About he reache of measure took and meatr elegants were heated into the name and never was a journey undertained spec wheel more Ship total week



thing that is still in store for the eviators as we go to press. At this date the two surviving planes are waiting a favorable moment to jump off nd for Ange land, where this mid-number vi-

constitutional and have close to the had left place of equipment was closed in the light of the limited cuestions already galed in less flights. In The the tool large were carried hatches, Bolls, Keekstee of werest kinds, some-drivers, files, pilete, trap until paths, cotter play and keys, malety wire, turn cable and plane nite, belts arrows, nucleo, colleges, spars plans, ignition searches, bless mechas, plan, point signaling from simpleness to skips at sen and a better ney used be dound, the the planes side less in the water and can be seen only with difficulty from a and patching naturals, tow, etc. Other posturant e-e-

Two hits of north-Pacific scenery that indicate some of the conditions met by the flores sisted of collective water business off and pur names Seld places, neiting pad and therean lattice. In the latter was control a supply of coffee and percentrated

> The wishes of country concentrated Said was early shown. After Nobe Martin and here feet ten docthis message ture received from him, dated they Meller Atoks, Nov 10: Tracked against assession in fog. 30th, politier burt

red. Dal-before the to conveniented field."

If larger equipment certical with the alreplanes were released and perfective filled. with ropes attacked. Experience was the terrible neutler that presailed along the Alentin Islands while the world fight not pooling through there, much was leasted about the efficient of the egipnear Pirst it was found improviously to bet the artifates all medicand out in the Into house the brass ninds that started or with webbodies would lift the plater from the notes and drop these again with whether that throughful destruction. Also during these station storms or "medited" at the hallow call them, the simplement dropped the light station. This appear drugged for eggs market. The above drugging become a nemon, and for each

on the Abertiers, Lieuteport North, who med command of the Sight after Major Martin was forced out at Port Moller, west is really recommending in change in the ancient and province of the alreadys. Set the Atlantic port of the Jenney. The exten pressures were not needed, however, very halfs during the Atlan-The extra preciutive the flight as the wind sid not him as fetering as Atlanta.

Almaha. Another mesenant thing in the line of outle ment that the Alaska experience showed was the ne sitplems report to the wind, rela sad soon over



their even regaining, at one of the stage, using an improvious just, Genters The first artifact of the Eight—a parasole hashing; the place, just even explain very core made in the referent state and the place text on, they a place, their, in place is the place in the will be of habits for in- days. ent of the fight, we have those views taken in the early stapes

round the world planes riding at ease during a sign.

Free the time the flight left Seattle satil it

tracked Japan, the almietes had to stand up under the reserved killed of wearing and the first war the stronger sta material world by called main to obligated is light, intressing to note here well the aliquin what the extreme of elimits. From the inition cold of the Aleskon preferate where the ice formed six keeles thick on the simplime wings to the heat of the tirtent, all within a few date, is a fiding that radio for effairables of the cost such medicines. The solely change from the extremes of temperature tion to trying usen the physical strength of the pilots, and It is proughable that the meters with all the salte clear atives and other adjustments that any made to the themsendth of an inch, should shand the strain. Lives teniant Suith reported the weather at Airpe, Syrin. 110 degrees in the winds: Portlegs of the flight were made with role felling in sects. When the austro-station from Ambala, India, in Karacki, a slight drintle was fulling and it was expected that the plane, would save perfect that the plane, would save prefer the plane. was encembered through which the solution, agency toward their pail using their instruments to galde them over the plains to the sec. When eights tilles out of Karachi, Hestenant Noben's motor began throwing writer. There was its good place to step so be pushed on with the other two sliptures. Type landing he found a cracked cylinder. In the town was an extra Sended a cracked ryllinder. In the lower was up outer spens with twelve panel colladors and it took but fittle first to get in a new one and take the sir again for The little tools carried in the atmisses have ob-

The little tools carried in the algorithm have obs-served their purpose well during the flight and mann it repair has been much in sheet order in landing the right implement of hand. Natiful mechanical north with there ittle tools has kept the flight together with martirally no drive. The following only from Line flies fille feels has kept the flight together with practically no delay. The following cube inou Licu-terant Statil, dated Yearshire, Jepan, No. 22, went offer receifing the Japanese blands is a typical reput of the contribution of the second second second second

Lets the thirty three highest Migney after thing over stal under bug at both finite three from mad both substance step Left Minato (we've foug the author from forced back with betterp short handed required and off ore Officen and Hight handed Tokie five thirty for som frage hours and twesty mission way."

This was a latelity made at sex, a popular effected stal the flight taken up again. It is not often that a ship it was can they and make her own require them proceed under her and point. One traces for the second of the seriel flight has been the production efficiency of the relation. Each one of the pilots is an good on altridge mechanician on he is a saled treast field Netwer has frequently here mentioned as the road expert simplate mechanician in the viside north and as the flight have been larged; an oughnessing frot, like printer and extraditation with the other aniators No. currich isodel. Nearly all arists as have less thing to warral years are cardient alrelan newhates. This is true lessues their lines mu-dres depended upon the motor, that this place of surbiters has been studied with great core. The first take of a water whether it he from a serious cause of not until consequently whether on home-like banding

fights like its rise around the world is consummiration Net mench medica stations are largest along the cette of ilight to furtish the exact neather condition.

When Destroyal Smith led the flight out arrows the While Detroited States for High out arrows the Positio count toward the states of Japan, he had be-trived inscrible reports. But warming our user the crited toxonic reports water a standard of the realist. The stight to doe then and it moderful piece of authority. The fight conmenter gave a signal b risings the regree in the that heading; they fire he thet busing; they are ... feet the storm and attent the fittle living belongs in the said Paritle Siere they undered to a skeltered lay. but enter the three mile fast, and maked for the stress to validate after which they reprised us to Parasabbatt in the Kettle Is lands of Joseph Rettle:

welfar spects would have provided ranking into the on a flight like this one is radio The for and spensores that Mini direction finding an artery would ofer little next if he could unit Larry his bouriers. Mad-re one said in these and for or seasily free free wind, and foliag through would be well except with radio direction finding Caferinately radio is not widely enough exce



Instruments used in savigating the planes on the

to offer ald at the powent time except over limit eres. The similates used on the world flight could area. The auteums used in the work argue count and have carried the finding equipment because of its weight. When Liveriennia Nelson plants through a drive the Angust 2 on his memorable flight from Exe land to locked by would have been sided by raffic

As it was in arrested for the vities at one over which he few to peint news north for the goal in order to check his neepess 100 this fight to looking, Livetenests Nulth and West-intent hark ties Nelso eggesmi is the fig. let conjugate all fines could here upded on tenural leabend When on the follow

by do. Lieutenatt Water was formed shown 115 miles of my with a bridge off persp. No heating mend lave loss more really found by radio that this is a matter that will be worked estime Liveryant Web's freets in the North Atratio basis bask to Major Startin's found handing in Portuge Hay, Altoka, Works the eight pictol, better our ried a lead visted which he

ion of a passing try The navigating problems of the World Flight leave been alonly new. Liversmant South stand upon his arrived in Lunium that he had landed at on place on the whole 19,000 order, over twenty countries, where he had not introduced to head. This in their was notice a Seel and it is difficult for a fiper in America to fly New Tack to Sun Francisco for the first time over the cour try, and not land somewhere and set like wheresheets. Sometimes satisfies get lost fighty between New York one Weshington when driven from their regular events. to free or rule.

The surth induster enupses corried in the oft arrend the world has been of greet assistance. Valve side that here been learned from using this halfts-ment on the flight. At all the stops where contact has made with seven women, the altitude companies were carrially checked and prejuried. Mights were made in the air over ships and the compass readings moved. then upon descending, the notes were consumed with the while compare results. The strik indicates was also a tribule instrument for particular during the world flight While erossing the Parity, the axisters there and species leaden and watched the grift of the species still spoke bears and without the IIII of the sixty sixty the extrem size of the inflement to determine the silentity of the what and its strength. This was necessary to check up on the drift. The sentent is at ments to check up on the drift. The sentent is an festivated that is designed to be very important in artial particulate, for on the world flight hershould make relies total by form above Sape or cleans that showers the worth. On the route to became, then tennic Nebell few observible fog a large part of the may. By resulting the angle of the evication bodies with a sexual, very northele locations can be made on the I Clinic and already have locations been read with great previous from uniquest. The next neith excepts was the case of Admiral Continue of the freingness Navy who led his place to R. Paul Becklaser than 11 hours fights from the Cape Verd The need at observations from his plane and had at set case upon the little blands that are eals 20 fact above the nater and a few hundred fact with The American entertee practical for many days in the present my of the western, and their work was not

The similarus father around the corld also cards tum and both indicates. These instruments are all on one that, or one piece. When the ground or horizon counts he seen, the directions of up and down are being counted by seen, the directions of up and down are being to the housen senses. But with instruments an airplane tens to disease sufety when the horizon is obscured to for note or derivers. The turn indicator is operated by a small wind-driven greening and whetever the sirplane tame from a set corner, a lever engages a cua which operates a pointer and the pilet out yet the plane lack on the course. The hapitag indicates operates on in invite basis. Whomever an airylane is turned gently, or with the peoper assesse of speed, the recoglist of perc

public remains at zero.

The World Fright has attracted much stretiles its whentile strete and many impative have been sent to the Offers of the Crief of All Perfor in Washington, It. C., asking for the details of the flight, Jint it will be usually weeks after the flight faithest before a full and commenced to spent will be turned in by the and congression report will be triped in by the Flight Communior, and unity of the things burned on the Joseph will probably not be fully appreciated for several over—list, that the flight is a triumph for



pelater

Octopals, 1994

Our Psychic Investigation

A Formulation of New Policy, and a Rejoinder to a Harsh Critic

By J. Malcolm Bird



way, we had to very definite plate regarding publication, sare pebikation of our results in secpaticalism of our revails as white form was by all means intended. Name popular west to before any medium rates forward for our exundersbig; when this faulty on curred, we granted the urgest request of the hore look. These that a receive he solution to the strings. This Non-river of course, with the understanding that both

ing should be printed unless we indicated that the

ertal was reimped. North of the eletters with "Mr. X" ladge sufficiently dilve in taske a firecessor account, in our haloses appropriate, the propriet took exact with him, each eventing, our permission to print in the next meeting's paper his impressions of what he had seen and bound Hat the reporter turned out to be a little more church table breard Mr. X than the facts really warranted and to redo matters more, when the headline writer get to work en what the reporter had written, is per to wreat on want the reporter has wreath, as source of the significant lifes for display at the top of the column, the result was always some variables of the statement; "Scienciate impressed by Promotivation

New the fact was, at he steam of our stillings with Mr. X did may of the Justices we photo-motion of any description, under conditions which would lead to the inference of possible granizations. The performance was very crash, and the only problem which it prewested was that of less showing it in its true light Accordingly, our Judge were decidedly perputied to have theaselves pictured in public point as "Improved" he this predicts. When, a day or two after the that sit ting, my statement telling how we look enought Mr. N end in the papers, the Judges Self that the getso much that we led been advergenmented, or that we

diams, Judges and Newspapers When we came to all with "Mrs. V." the Samer-write-

tag body from the Middle West, the Tours get an oppose our refusal to here aprilling refusal follow black skillegs. But after the skring at which writings nere present, the reporter incided on interstraining ter gid members of my Considier. Having had be coldence of substitution, we felt obliged to exercise the greatest carried against earling oppibiling that which be interpreted as throwing suspicion upon the holy they appelliagrees to say anything spained the writings gave the reserver the lifes that reported then us probably printer, and he wook his stars averdingly. The healths writer this like need. New it is only fair to the members of our Countiller to see that all of these street, mad the wholes of airsalitize receives and having running accounts of our s in the papers wille no note will string least one of these nucle this protest very namely. est one of them hause has present very health. The es about their work with any gives medium, until

ers, users; cover work work key press medium, until ir final judgment on that medium last been pub and in the Sernymon: Assenses. With the recorderment of our strings with "Mar our present medicus, we were forced to a partial of this they carwing. It was ever that ou response on this tree convent. It was there that say work with Margary would be lag drawn-out, and would be accessed, und would be accessed has peed by wide publicity. We therefore west quietly to work on the case, suching solding about it to any of the mesquipment.

The "Margory" Case At the same time, there make the problem of how to hapfin this case in our columns. We were no-leded that our Counsitive would be at work with Maninded that our Genutitive would be at work with Mar-ory for more morths, and that dowing this time they would be markle to give time to any other speciel. We tell that the same in the same information about the contract of the same information about It would patishly be quite our of order for us in publish scatteling as from the Orientzielee, until the Commission blood to made you this final world. We therefore began to publish, under up manys, informat occounts

of the characters of the confirmation as work and of be Connitte's experience with it. It was intended that these should been more with the Connitte's ores, without in any way binding the Connection The position was a little difficult, but I believe out? have been materialized, last it not been the one univer-sern complication. The new quarter, on the appropriate of our Joh and August beers, from the secretic specie tal lasteted to make pray of them. Again the he the writer got in his deadly work, and this time the trust precedenced in recognition to soon as though it entertained from the Judges. Quite tournelly our Judges Sell that the closes of objectionshilly lead bert attutted wire a median was viden repe as bester was one selector belong about to with it with where is select of fact two of the Judges had had no

strikes, and regarding alone note of them had forced any fixed opinion. Very properly, it was made about to in that if we could not find a next to rheck each piercowstation, we should have many restrictions. For the Immediate Future

mything I say about the Margery care as near, a if they are going to present this nutrital as though it emanated from our Judges, I must not not statisfing at all until our Judges are roundy with a finding. So we have agreed, in this and it may reflequent cases, to bute nothing minutes to say, otherwises, smill we are In a matrice to order the Contralities's final medical This agreement was revoked had an our September lear was gring on the prov. If was no heary possible charge the mokeup of any page, for the invertiof an explanation of Marpery's aleeter we could only withdraw the two-page pojetic stery helity, and sele-gitate helity acarthing else. The more absence of the solder model not have been serious, no have had a perfect store in every lower store Man. 1922, and our everyor broker out dreftchen very mell science is have ties from the subject. But we regret that the senation but to be those from his throat so unsurededly and

so without exploration

What about the future? Well, long before this are pears, our Cougnitive will have betd a series of sittings viáris will extellé, po for locard a trellet, and wheth coeffe that our Normaler bear will amount the that make with Margers. We have agreed with the Judges that when this extent, we shall proved it quit er and on its merits, without may further si They may elle westurnous; details in wageret of their finding, we shall not do so. But storting either in the same bear or in the next, we shall earn to ent of the Imperiage places of the well and the Committee's strings, as I have seen And we shall person this in such a way as to divers it estima from the Dougstoods delenant making it clear that they are re-provide for rotaling that the S Dotton' Award any observe the notation.

Describe for Building was the laste "loss" or "Its" of ther wells. To resphasize all this, I sign the prosent statement in any seas right, and not an Newtonity for

Turning Back the Record

So much the that: I wast new extra solders rather slengtly. We have get hundred to the above of the shorting spiritualist wise training out to any for any and every auditors, we have not equally last esed to the militant shock where he is an used in our fellow to enders offend with the same provide In comme with all other value payrile reventures, to sings for, when the since stree from either come of estreplets, that we lasty exerted too far is the direction from which we have the counties of criticion at receivably equival is aderest with of such character, and sees respected on such a study. on to make a religible even expedient.

When misreprestigation of start sect interiors a cost to species up, the sufficient execute scient whether the matter is not too mark staries; bloomy to have our attention. The starter, if the attent he still a writers one, is complexically "No." for exposure of No. X in part of the literature of purchic research, and still be

cited by mady years to ness. If we permit a series series series, apon ser include to press amorbied, title after become equally a part of the literature, and gales in squarest creditific though my follow to worth in It is for this reason nather than through any desire of our seen to know dead because after that I excuses then and new good the recognition's to Mr. Depails liquides.

The lattle Matter of Mr. X

The worth Mr X, by it known, in addition to the her-eight seelings of flavors and report. If directed at one one totals translated recounty from a person of one one blood, less by that page. Statemants er have been delivered through hou, in at a feet different Louisser, all seekes life a patter and all appropriate to the "spirit" alleged to be apeak Note the a matter of personal potentials, it has alongs would to he quite consisting to picture a printer "torough" medica (I will not spen the quetion of the segger of the savegges, whether they are to be explained spiritistically or triesathinally), would be once by a patement described in reliefs for greed to attend the fronteless production of Market effects to go with his greater expositative aftersaces. After this recard, has been made and disposed, the expellen of the prostampes of the observer parsendance for our Consenting is not in the least affected by situition of a million evidential "consequiration-

be regarde bins so the medium par excellence. All two fair. The regards bits are fix get releases are after the on expense. Pill perfectly july But when he exon exposure. Fill protectly late. But When he ex-hunces the secologists of elimperation, and makes a large-straft upon that of elsewhite, in his effort in expense life contrapt for me and an Constitles, it is less fair. And when he ashequesters the facts, and very infravillal spirities paper "hight," of Leader. I In describing the contact apparatus ment under Mr X's chair, to because his shorter from that chair, I

Mr Brailly, however, tildian etheratus

probes to spirition rame largely through Mr. X, and

received through Mr. X.

esquiration would re-point Intelligible to an over wright of 125 person, and that the medical was naturally hunder than this. The soic tiles here was to sken the the new York research would not at the cold to be a fire the neclinary aspects arrest the electron was periodic field formers aspected. The electron was periodic clear and definite. Yet Mr. Bineffer, with a sharing reference in an Tame extra of one-respirate," persettle it as on related in that the areacute, would see

Distortion the Eviden

He jobs this telefactor, of course, with the claim her neight below the Efsporth Rate. This he require he completing his case, excessing his neithern the empletely damaing are still an Oversities. If he regards the estations visits as related with Maself he is said; microber in had not over to our attention when my July, 1955, untitile word to press that it was advanced electric theoretical in personal to provide the To part II, I published, in our August, 1955, reser, it

leading edition

the most possible of problem (the

which the taske-up of the two effected, a statement weight of othe person can ample to keep it continued depresed the to make up the tell-tale light without It to itsuffey had been so industrial on his senticle for brooth torte up by Sup- In his heat for facts that could be distorted to said his company in said lands have received fitting this onis that even a shouthy soldingled with the arrive of lrish desects behital bus will agree that, after girling off effects recognises to before his weight to be a sufficient medical wire weight becoming at least 150 causes trathfulls basis that he has been which considers god the experience lace he felt the elightest places at effect

Plaisted and unfinehed views of the giant wheel-case for what is at the moment the world's larg

Research and Power What the Discoveries of Today May Mean to Tomorrow's User of Kilowatts By E. W. Rice, Jr.

term) is the nours

of our consecuted power, he matter the intersecute age real, oil, nater or wind direct transferration of solar rediction has been sneath, but these for without success. It is

probably too internstitions, with the racie of night and day and the intervention of circuit, to be etilized directly. The most protetake within world appear In storage through proving produties. fundamental of physiological and and although still for from connected predictity, it seems to afterly the greatest single loope for plecing out office the exhaustion of the petroleum supply Experient

peticals of rejection, und

spender for perceivating the regetectemical strenge of the san's radiate chergy, may still be discovered should be differed) weight for It has been suggested that the pho-elette press may expassive of thirty of eros. This phenomena should be investigated, if for he other create than that in it we apparcatty deal with the electron

For the present at least, all partieds entiresplacing the direct expression of refer resiliation into recognical or electrical operary are largely dependent for flacin veine upon the storage of

electricity, and this engage that see rely appearable for such storage, the electric such stronge, the events' storage bettery, has ad-reserval but tittle with the pearing yours. A rectical improvenent is certifiable need-ed here. We need whele that he been edge lend have jet bech the beet, but we mad bet be decoraged The problem is one for the

Along with the re-needition of Greet utilization of other energy, these trusels, in the layrant's scini, the proposition of topping the interior heat of the earth as a power It was be recalled that as leng upo as 1904

able execution to be direct off. and again in 1903, Sir Charles Parsons, who ext in der conne below, untlight einrholling in open to its clauge of betag a rhoman, proposed the ull radiation from the sun in this prisent. In bring of a great hale true or twelve miles down, its some

ALREADY the British Empire Exhibition at Werthley, over London, has been raid in our spain, each, in particular, are British currespondent has till as something about their word in Conference being held in convention thereight. Of these who care from all content of the globe to attend the Conference, none gave a most cultivational and them Mr. E. W. Rea, I., at the (American) Control Extension. Company. Mr. Rice's discourse had to do with the new developments in the generation and application of parties which may be expected to first and of the research of today and treasures. What will first and of the treasurch of today are precip and press-to-or even three-field empires life the mercury-apart tentime districted at the foot of the page; vacuum-tube transformers, looking more or less like the tubes that ornament the lost, in piece of the cushesone and complicated transformers which have to be used today belonerer the current is brought from a distance; and other intentions that have already got well started. What the future will bring us in the way of new that have eleastly got new source. What the journ that think us in ne way or rew thinks as yet activationed—nell, by the nery nature of the case, no man can predict that. Mr. Rec's paper has been severabed abortened is got it tribbs the limits of ner upone, and a bit medified to make it connect up properly at the points of computation;

companies and calculate stone to written the facement the costs. This suggestion should not be

Alterace it opposes in his own words.—The Editor.

allowed to its fallow. The most enforce for Churies statement that the own of each an experiment would be triffing compared with the voice of the information

ship. This is a big lifes, worthy of a nation and shadle support, or even of an international eventife enterprise—a suitable subject for cooperative work

The propesition of tapping the interior heat of the worth as a power source, of course, functiontes the lay max, largely, it may be necessed, through the idea of westling for a ching which If entries. Hat to these hav

ing even a superficial knowledge of the work that is be ing done by selections and electrical engineers today, there are other phases of re-march which offer fields for speculation equally interest least, nover inspertent.
These other phases deal ofth increasing the officiency of each torens as we now have of generating and utillaire of petersony and ten-laing power. The finding of tow section is a matter of greater measure to the fu-ture than to us. Not all our materpower has been devolaped and used, and there are apprile stores of eval and off

for the present. The pres-ent-day responsibility of re-search is, while get overleading the development of new marrow, to make great two of the presence that we know we have The power problem presents at least three dietin to in the formatical growing all some times and new nations of, those already to service; and impo

methods of tremestation which will make it possible to apply power at increasing distances from the poliwhere it is preparated. committee the others as great task of today, fol isstant has but a stight life what progress along th



e paper of a m

International Expenition of 1878. Some of un ther the awe inapped by this manuscoth engine. mer glant of that tiess. a power gains of their time. Looking backward, it is difficult to realize that this real machine developed only 1000 becausewer. There some handrade of power units in the shape of stress techinas, each star equal in power to twenty such enbes, while the giant power turbine of looky will do be work of one hundred of that Carlies engine in 1978. What the continued decreased for power and the

eats successively fread for supplying it through the editor of electricity have resulted in tasy be sunicted in terms of the induces design for larger was units—though this densed has been seriously Station by the presidenties of the stress station, from in 1900, the largest stress-engine electronity-driven unit was about 5000 horsespecter. The slow speed of the atoms station tastle excessive the weight and cost of the condition stati. The practical limits in size had apparently been reached.

But experiments with a new method of man had been gring on the years, and in 1905 a large miral station of the Commenwealth Edison Comments Chicago was equipped with three 5000-allowed sun-turbine electric units. This marked an imper tent tip forward is the generation of power, as the tent tip forward is the generation of power, as the tential cost and operating somether see kilometer of ral grarreting stations were energously reduced

ver province practice. We now have 50,000 to 60,000-kilowatt store electric mitte in daily operation, not only made in double attentionable evaporating capether, but even in double attentionable evaporating capether, but even in dapte terbineouslymerator units. The latest demand in far 100,000 kilowatels, and units of this capacity the already been designed and are ready to treate facture un required agantide, transferment have govern from the

manufact, (mainteners have grown treat the 10 kilomotics of 1921. The 25000 kilomotics of 1921. The steam pressures of 1886, of about 100 periods have given vary to pressures of 250 to 850 periods to constitute the with 1500 periods recently installed, and 1250 periods under a vive development. At Ninguez Falls, the stars of water-sheet talks have increased year by year from 3500 kilosusts up to the present units of 65,000 kilosusts, with even larger units under count-eration. The largest central electric power station in 1882 contained a total of 500 hibrants, whereas at the present the reason stations of 150,000 killsworth on nazaon, a large transfer inco-reacted a capaci \$50,000 killswells, and stations of 500,000 and 000,000 atte are ander development.

in transmission, the process used has steadily ri free the 230 voits and 500 wits of the early maintain Greet-current days, to 230,000 talks for long distances From the mer's viewpoint, the art lamp and incan General lamp were the early devices for utilizing tric newer during the seried of 1890 to 1880 Thes followed the great expansion into the field of transpor-tation—the general explanatest of beneditaria care in the electric trailing, interesquentian of beams and cities by electric determinent lines, even replacing the steam legeactive in underground military, terretaris, more ban ligne, and climbing meanthin groups. Consumently came the nee of electric power in mines, factories,

stores and hotels, for every conceivable sorvice In rapid successing have come electric heating, with all its applications of great importance, including both g and webling; the electrically-heated baller polytic processes somiled to the religion of various

while work has been carried on in it, for half a cettory and more, important prog-6000,000 pogsda eč singe having been electr cally refined in the year 1920: sharply with record sing, with no relicting twee of capacity of from 320 beexpower to 180,000 borse-power, or from obset the lest conspecial to the reet powerful ships yet orgatracted.

the efficiency of electrical desires and apparatus have been usede. The invasion met lamp is a cue in point. the fitteen truth Unified Edied's brestin of fide land, the energy conmytion had been

by coreful and skillful negatherpring, attention to detalls, and expectes of the facting server, from few watte per capille to about three watte per capile.

that date an entirest scientist who had carefully fid-lessed its history said. "The relatility of cacion at ligh temperature governs the officiency and the life. is unlikely that any better majorial than carbon will he fruid for the Shanest, and the properties of carbon as to volatility can probably not be changed." This remained true for her pears, and then Whitney profrord a large with a greatile routed curber Blancet fround in the exceedingly high temperature of an fround in the exceedings man temperature to so electric furners. This large currented 1% waits per electric furners. The rune the treasure flament, the engineered of



enarte leta

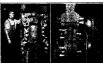
ids the made structionlie by the discovery of Dr W. It. Goldige and his medicate, of a method for drawing the metal into site. The tay of interior file results cut the opened consumption in ball, reducing it to 1.25 warm. This was followed by the introduction of an 20rt gas into the large held, accomplished the work of Dr. Irolag Longwood, which the resed the current used to size-balf wait per cutile.

The investig effectory of the incubincent land is infinitive in a pro-rail way of the progress formed prester efficiency that characterises electrical appa-

natus in general. Just as engineers have learned how terropingly large assesses of energy may be peteroled and used electrically, so are they because he pler infelials small assesses with amoniar arthursus a efficiency. For east uple, there is radio It has been stated that yet haps the nest minute elect

> when receiving an importupi engagement from your renote territory. It is so small that it is difficult to give its hamitole an similarno It reald be expressed in talli-watte, but Dr. Whitpey has segment that we could properly think of it in 'My power re omitweed with bers power; and he has coinclated that the power exerted to a the to lithing treet on tack would operate a wireless reexpend where I are we with ter of a custory. This course is, because, sufficient when

amplited by our electron vict um takes to be beard in the trieghour healplace or through the medium of a load speaker large sees



Prest and side views of the latest development in turbine design, practically all finages, will operate at a pressure of 1200 pounds as perste at a pressure of 1200 pounds and go over 2000 kilowetta

One start openier restraint in redsting the tr tion to speculate as to the effect usen the world of this tion of electric power. li has been that shough the resting of implication the infof radio power will be greater than printing has been upon the growth of man, and that the tire will come when make half speakers will be part of the graph ment of public buildings or market places in a city, town and harslet in the civiliani countries of the It would be about Impossible to exage the value and imperiance of sprises instrumentality for the present diffusion of new and for the edu Clearly related with the development of new pope

of energy and the refinement of those strendy utilizes in the master of instructibing the operar. It is another the reset important questions from a practical stand point reafronting the electrical industry. Here, notable program is nise being made Parity the lest tweets arens the research age for coefficial little law grown from \$3,000 to 220,000 volts, while about 75,000 to 100,000 kilowatte per el

highly satisfactory results. likter saliage assess technically tending talis has already level orderrated for test purposes at auch higher voltage, and informery experhere conducted at over a million with. If it is never my to instanti electricity over legger distance, the linductions would appear to be largely engagers

"It is unlikely that a higher pressure that 22s kilo wite will be required for practal season (reportation for some thee, as this preventy is apparently satisfied evenus less and general stability when operating at \$6 to \$6 corbs. There are a few later updeveload mater moves in the world with a million kilonatic or ever of potentia money enfortunately located many 700 to 7000 seller

from their netural nuries. These exceptions can still receive savial treatment arches 20000 with with a reduction of frequency to 25, or even 10 cycles Honoret, the use of direct current for such special uses in well worth conditiontion, and for this purpose the targest take rhallenges investige, no h not only of rectifying alternating current, but also of cal energy is that which onerting direct current back into alternating current The carean tube is no longer the frethe decke of a few years up, when it was capable only of handle a few watte. Takes are new regulative manufacture cannide of handing 20 Librarille of party. Takes of larger capacity are in process of deschapangs Built have not expected on that we care will have stooks ing our longitudes, both to the teles of high-course various tales, rapidle of landling when operated in author, the power regard for such applications Descriptions of the or the sale alternating car non ure in operation, and higher relation, under test A great test exists for independent colors of 100000 walte of ligher. Some have been made experimentally More research and experienced a work in this inspect air lite is required, as apparently present design an menufacturing methods are not sufficiently adverseto produce 100,000-met rubby to constructed quantities

> Then we are building reagree in the t of the persons in this field-greater efficiency in the use of proces through better machinery, better methods and learning how to trained it to greater distances. (Continued on page 234)



Traffic Problems of the Large City What They Were and How They Were Met in a Thoroughly Typical Case

The destination signs represent but one of the many merful ends which one of these beaces stands may be used to serve

BAPTIC every cerevalent, and tenther than the continue are engaged enveyables. Occapation is the rate in the ethics, portion to the rate in the ethics, portion as two counts of the country districts, bereing as two count atterior like the Ideological to the exception. As will be about districts of the problem note consider the virtual new ord as the winder notice positive, but it may consider the virtual new ord as the winder notice positive, but it may consider the variety markets as the note general wall the none seem, and consider the variety of the property of the

He conflict accounts and decided in admixed the particle is $A_{\rm conflict}$ and $A_{\rm conflict}$ and $A_{\rm conflict}$ are shall produce the staff in particle in the first in particle in the first. In particle is the first in the staff in

White case is the failed. While not one of the recytroyal, it is a part of great conversability appearanty of the part of great conversability appearanwith here had explored to the same leastly traceful hearintowe benefit a rest in the contray, and he within a few section of the same leastly and he within a few section of the same leastly and hearing the same expected reside. The result is at table possible which may write the same as a test for effect rather, there is no contract to the same leastly and the same leastly and the same leastly and the same least results and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the latter of the same leastly and the same leastly and the same leastly and the same latter of the same leastly and the same leastly and the same latter of the same leastly and the same leastly and the same latter of the same latter

In Macrosci, desis, met was in hall node alle und und the Particular Service of the Particular S

In other defect. The latter conjugate to explaye the bact deletable engineers to gather the facts, to employ and work them and protect increasements that will go a locality covereint. Understanded, many manipulation to the confusion of the language year-the, without reliability the factdensetted course. What has been done in Burdal, have cover, by a depth of the confusion of the Council of The CUP Planting Commission of the Council of

with the control markets, which is obtained to the control to a region of the district.

In the control to th

mantic-if not to every after our passenger and corp peleodic. To despite, the perform was disjoid into the despite, the street, the perform was disjoid into the performance of the was a study of the invested of instift is fold our what could be done to most compation and to reside the most of existing street also. The second was a study of traffic exclusion, where they work, justing of contentiation, when convex they and what remodes should be applied. It was recentled that the streety would for infinity when the position.



Not alone in safety more, but in many other place the finding beacen is vanily superior to more mark on the pavement or signs at the curb

7 Int that it would enabled a bade for a continuous coffer which would offer the deviation abusine. There was to fitness in a clear system, when their a large was with its major and extract factors in the continuous continuous and according to a street and its continuous and according to such cases of the conduction and according desiron. Such tartific sought force quickly is a for analysistem, which captry into the bedown time. Deveme, there is which captry into the bedown time. Deveme, there is not difference. Nath tartific approaching a comment of the best of the same paint beyond. This traffic care is bested for man paint beyond. This traffic care is bested for man paint beyond.

see statement to the city, so that there notice are not to principal statements. The spat fire courses of the city for Parasing Considerate, a may be reproduced asked the exists active reserved and the values of treffs. This course is the control of traffic, the volume of treffs and the contribution of the course of the control of the course of the c

the agency wave is selected to the constraint of the constraint one of the constraint of the constrain

The relative to the last hand of elements of the control of the co

After the related way step, the other possible subtance of the control of the control in the conmends such as New Year City, on which all new systems is best illustrated by Pitth Avenus and other standards beaut treft is being to present the noncontrol of the control of the control of the analysis of the control of the control of the interest of the control of the control of the interest of the control of the control of the interest of the control of the control of the interest of the control of the control of the interest of the control of the control of the interest of the control of the control of the state with interest, and two finite for not said way and control of the control of the control of the state with interest, and two finite for not said way.

Note at leaster would be an inceptative method to regarder the regarders and the regarders and regarders are regarders and regarders and regarders and regarders are regarders and regarders and regarders and regarders are regarders and regarders and regarders and regarders and regarders are regarders and regar

to of the lattice would agriculture only hyper. Both hypers and hypers are the lattice of the la



Shelf fo hypose field treffic. A motoriet can re-cost step part of the city directly without pass logic the business area, yet money of them unnedo so as a menter of habit In order to decrine this plan and to make it function tematically, it is the intention of the authorities to see consider resitty information in all directions on samps wherever two or pace notice intersect. This is board to refere conception. It will also be a eer to visitors wis do not know their way. will be a means of breaking established habits of latel appropriate to the end that they will take cottings width

will take them to their destructions much quickly even though such number may not always be the electron in point of dis-

wares atmete any on received note tion for oragential traffic conditions if they are confully worked out. In Buffalo, sis of each streets have porred as mo-safel that others see claused. Investi-tion shows that they have been equally consected observators. The principle agen-lick Haffais is working, is that each way street must have an adjacent onewar attest which will corre truffe in the direction; each ree-way of bulence enother. This is of the ri-

The next problem is to mark one-way mets so that motorbes will not enter son from the wrong direction. The level ed found so far has been to block the uge of vehicles headed in the wrong tion. To do this, it is not necessary to block of half of the street. In Buffalo way street begrotte will be placed ewint out from the curb, the distance offing on street room and retains think, so that they block the entrance of feles moving in the wrong direction or an possible but without interfering in the proper increases of tradic.

e beantix are designed to flush a red be remaine "bloom" to contrary (mile and will the to side arrows shewing the direction of truth const. Appropriate wordings and across are ed at the base of such installations. The result is vanity some authorizing than arrows or similar signs on the poles along the corb—the only alternative and

Projections mad also be warmed of one-way theredse they may but expect traffic along the left stde of the street and are liable to latery. The traffic beacon placed out from the curb per only warms then but serveon well to protect them. Fadety sistes are nortal to trollos-riviers lest they have an even more important ring at traffic poverners. Vehicles may not reason investment. I regions may not peem a straped street not except under conditions of street which, which now note. They may, however, pass a constructed at a sedety same. One last util:

to watch a like of relifies thelie to get by a street over to realize the commercial proce of streeting traffic at eac Prospectly a wide truck is at the bend of the line. In such once the torse-ment of traffic is no factor than the street Buffely makes permit vehicles to passe et care and belo materially in speeding

up traffic movement The subject of parking is a difficult our to handle in every city. Bullion has de-released a practice of storage areas on the edpie that rebiries must stand some type can weeres upon mand were-re and must therefore be provided ing space. The centerry principle holds that, when when street strengt of

bolds that, when street screene of times libreferes with generating, we see in treaset have separior rights, fall in addressing in freezew the per balance on those statters. A de-fined effect is planned to efficiently pertian of va-se of the "half-day" or "lift day" variety, which is existed to neat powerfor reprinements. In the interval of the property reprinements, in the form sted to most present requirements. In the interval, garding spaces are wought and planes are letts; laid at next year's condition. In station of a station or system to be carry pass-o conferrably, safely and as rapidly as possible from stationaries. On the other hand, the accountry of the streets for review trains, that made it sanditions

that street care should interrupt relicular irrefle us ns to Proficio to Immediante the sido

stop plaz, par izto effect seme pears ago. Cara, carolde of the competed district, any at every other conter of the secural trip. Incoming care stop at corners all-ped outleand. This has materially aided the reconstriof both street care and other vehicles. Incidentally, the fact that two cere harmi to conside directions never pirp simplescensity at the state output is a point for in keeping the street rees. It is reconsended that a plea of fare evilection be psi into effect which will still further speed up the norwayed of street cars. According to this plan, the

etger pays life face gening on, laboural; and when BUFFAIO

> the lendance area to lend and uplent at both extraors and makes face collection a marter of a few passetyers nt a time as they get un or off at equipling points. In was cities, the time of error runs though the body over has been handward in 30 per own, and in one own. per over, by this such

mignie lest a day le six beers or at least six deflate o your for such related with officer. If the average we like in Buffele loses on release a der the s loss per year per welfele le \$60,00 W. moter neticies in Buffale, an average loss With over \$2,000 ter dur artifaltr code lie citizens over \$5,700,000 a year One dellar ner tone and anic um mittees amidelale thing per while per day are repoterni ler so that the less is manuscrimably groupe than the figure given Every city has he trading area and cort large of evall brothes area in a city has oler a small fightness arrog in a crity has used a fruding seria. In dops of stewer transpor-tation the trading seria was same. With the antecasidie it was greatly expanded

service. On the other hand, for vehicles with driver have a value of less than the delay an lower than

235

With concestion to be contracting again renes people living between to leaper drive to the less everyword this rather than suffer the lacesvalences of the other Consulton is therefore a very interrupt factor in the volume of trude, it out with trade metry less and the cost of the even en tended efforts to relieve congestion is very which consents to receive confection in tel. Carriel study and proper measures for relief will reward alto city were of the congrelling informers have care of and continued study is expected to above even greater opportunities, to the dated and delays returns to a salphrate Refere my treatment of accidents cur in recording, it is necessary to determine where and her they secur. This may seem a truben yet few citibe steaming of on their arides condition.

Baffalo, it was first necessary to develop such a picture. It was decided to deal with error intersection feet et the nake architec unities. The serves menting problem may speck feaths and perious injuriwhich accurred at street intersections and an large paye ment areas in Suffate. The principal purpose of this trup was to determine the serident conventration points.

A meritalisary study may made of other accident out

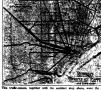
Size Buffele has not multiplied a cont never of least probats, such a study count now be pertrately carried fremant Witt in view a pin may be planted, upon which all peridence will be specied as they occur. The nature of each scridest will be shown by a color or size of pix. This will be showered by an educate cert pened and arrident hypothesisms. Such people more much grout value that the plays will by worked set us modelly to presible The arcident spot and shows distribu tion of serious peridence only, it does not be ball to be specified to be to be serious and the ball to be specified to be serious and the ball to be seriou shoted 80 per net of prices acrise

> 85 per cent of all periorate civelenat street intersection, and sirend 30 per cent of all serious arcidents conpensated at \$7 toterwerfen-An investigation of a product of these pelate was made to detrining accid regard. Archivate Weter freezy to be due eincipally to traffic irregulatilles. Traffi ting of corners to the extense left without reductor served to a good filestration. Back a material greet on the wints; sittle of both way be monorished him from other fiftee.

tion. Take such emplifying pedestria are soldered to a high feature of upon pertel deaper, particularly at picts. Own eserthes in Buffalo, music short left turns

-meterable speed The risancter of traffic, low visibility due to perbeing hallings or other objects which out of the view. and heat conditions technics to the relets to question were also found to contribute to sectionic,

It has been established as a rule of truffe that we at right alights. Where this can be brought about and dents namely occur. As a means of tooling this has and of proving voter could be done, a number of interse-(Osstiered on proc. 294)



helps storked out, screeks materalise surface such of the city will be used to drain some of the low traffic which would otherwise on though the largersalle widen would educable on though the business for To do this, it will in some cases be necessary to condition certain atmost. This will be done as part the organic sweek of matter encount that certain restings are recognished for prefer

their impersace in the plot.
The ultimate function of transportation is to car puretipes or goods from one point to another will present disposition and refers. Many large tracks over ers more than three delives for each hour of

Our Point of View

A Tribute to the Air Med R PAY pribate to that ledg of gap who have that snows the Post Other Transcuttinental Air Mail Norsles, Perhaps we are its circulars of the curst to realize its significance; but

in that great future which awalts unbelow, in which marked will own and to though the six with the were freedom and northfolio with which they freed by sea and land, posterby will write drags this transcontinued air service on the greatest stagle step over takes to audo overserciol axiethes a practical depand night reality. The success of this posters whose the te covered easier a didn't of eldination both to the Post Office authorities who had the Sith and vision and to the pilots who had the country and skill to may this thing through

The reprit de corps of the pile's in admirable; and It is marked by that modesty which goes eddy by obli-1005 commons assemblished. Only sweet these mines in the risk of the service appreciated. Very need to the seint is the fellowing queution from a talk by Captain Hyde-Penners, a reterna of the World War, shortly before he was killed in the

the write is date the world far note good than the from; we perfect a service for the benefit of the world at large. They, mind you, are the case who call us But stick to \$5, been." While you sit in the safe shelter of your often or sleep in the secure exestent of your bed, these look by day and by platt may be revening through rain of ever at their election, in the performance of a duty

whose mer to small, whose risks are great, and when only revent out he the gracitude and admiration of the American public. Let us give them this at least In process measure. That Gun Elevation Fallace

C West trates Treats, your over stated on one of the policy actions and a facility group of our older and reactionary naval ees who were Militriy opposed to the Totaly from the very first, and have remained so down to the present in this sittinds they are diametrically approved to the Gongress, the great majority of their briefler offeren and particularly to the wishes of the people of the Deltad States to whom he the way and not to these nared officers, the Nexy belongs. The apportion ment of warships to each Nevy under the Treaty, on a 55-3 back, was made after careful consideration by the hading officers of our own and the other nation concerned, and the Bountime Assessan believes that their work was most equitably dear. Nevertheless, laten the ink was dry upon the paper, the country began to be flooded with constitute that the Teres had done industries to the United States, particularly In leaving one float of a dissolventage in the matter of the extreme ranges of its gaze as compared with them of the British. This propagands said nothing about the compromise interiti advantages powered by our letted white, due to the fact that they are never modern, larger, sweet beautity arrand, and same locality protected than the Prittels, and that they have the adsatter of having less constructed alone the war, and

of embedging the technical ironing. The Novy wholes this tax-bundeted country to spec \$8,500,000 in valsing the circuities of the grass of our older while from 15 disgrees to 30 degrees; but they do not tell the country that if this he done-to will make the disputity is owner alost the use core engine than it is tedan! As matter- stated, the firther either white have an average advantage of about 2500 pands at the extreme ranges of our other widos, which are from ,

ekvation of our glass is unde, or shall then here an structure of about 5000 yards over the elder Drattel twice as great as af present. If we role our elevations rely from 15 to 20 degrees, the disperity in renge will discour; if we note them to 30 degrees the disparity, we recent, will be radeo on event as it is today. The musch is worse than the discus-

Now these older offers of the New who have raised this discurbance know just us well as the writer known that the question of \$100 to 3000 yards (Effective of mags, at mages of from 20,000 to 22,000 vands, may look surface on paper, but will be needed bein the stress and confusion of a sea fight. At each notice the skips will be practically bull down to one statler; the dispersion will be increased and the chances of a bit will be decreased; and the executar need he done by administer ten to fifteen pulse away, circling show the enemy's ships. These friendly simplanes, bearer, will be excused in a but old "the fals," we ver be sere, with the enemy simbous, and will be converted with pumping marking-gap builets (hersending radio spettings to their admiral's ship

An outer of experience is worth a tre of theory. and if we go book to Jurkend and the Dogger Hand air sail service; "Every site in this wasderful asin artists, we did that, although livetty had several throward rands advantage of Nings over the Gernany be opened fire not at 24,000 but at 18,000 years, and. sithrogh to had experier agend, preferred to fight out his actions at 14,000 to 15,000 panis, if we should one first the Beltish (which that fields) them will be the finalities around at 15,000 to 27,000 years more The names will igentiable expressy until metting sun in done securately from the most-lead.

We hold no brief for the British in this or any other matriceny; but we do hold a little for the mirit of "the expans dest," which has characterized The arrane deal involves the mustiry of treetles; and the proceed chapter does even to rivinte both the spirit and the text of the Treaty of Washington.

What is Super-power Development? DEE was, in the early bloom of this exenty when the inhabitants of our towns carried their burkets to the well for their daily vater rapply. Then a conge lift goes the idea of providing a central reservic and pictag the water to the lumes of the people. Today, in a good city you turn on the facult and obtain pure prestock water that has been organized to condults and water

The super-power scheme is piezzed to do the a thing with power that the engineer slid over one hun-dred years ups with water-gather it in a few great extended power statistic and "pipe" it over highpower imperience line to the over. The expresioner. the evenious and the abundance of our modern systems of water supply are universally acknowledged; the report power rebests will confer equal material less

spen the seers of power whom it serves At the arount time we are detrivated and distribut ing the sower which lies latent in our coal deids and valorisis, penty purk in the sum inherious and Hor-evaluating fashion of ferelears who exceled their burkets to the well. Our incorpolise burn to military of teas of coal a year in handing coal to widely scan tend powe stations, milk, factories and owners of small stress plants, and the electric power studies after learning the coal to rest their stream-drives gets store, when return the power by transcription by one much of the distance control by the real train In corrying field to \$17 the presentation business. It is undertake that our present methods are utterly preferrife and encourage want-ful. The Polyant Government to failty after to the stops tist and the spherosatter of the Sortheaters Super-

ported in fewer of building lungs contralised electric plants, and fueling their output into interconnected transmission lines for distribution to every kind of er user, from the great relived systems and fedure trial establishments to the humblest cost city or subtrism hope.

The west electric power reservoir thus formed will serve the section of the routiny extending east of the Alleghanies from Mgine to Maryland. To obtain the turns economy, the power will be developed in large plants with a capacity of free 201,010 to 700,000 horsepower, and these will be located conveniently to mater (of which they will receive uset energities) and to the coal fields. Hence they will be restricted to the seniours, the Great Lakes, the Oblo and the Suspice

In addition to the economical devi electric plants, the acteur calls for the full developsent, upon the same general lines, of the hydroelectric power which new colors, potentially, in the St. Law reace, the Niegara, the Deleware, the Potentic and the Susqueluctus rivers, the tributaries of the upper Olek and the rivers of Maine. Of the total requirements of the region convert, electric power friez cost will suze To per cent and the fully-developed water power will afford the remainder. Not only will this yest evalued lower the cost of power and greatly extend the pay of electricity, especially among the farmers, but it will result in the autual saving of \$60,000,000 toda of coal.

Justand-the Resulte of a Sortic HEV the Control Powers "dag to" after the leattle of the Marte, the war second the character of a siege of a pigneter water, combined German and Austrian services playing the part of belonguered city or fortress, the Allied resprise by hard and the Stritish fleet by use forwing the lines of circumvaliation. The territo dakting at Tyres, the great drive on Nigs, the diseaser at Cuporette, and the final effect to beenk through to Anisms to 1918, tasy all of them be regarded as great metter of the belonguered garriers on the lead side the battle of Jutland was the one gross attempt to break the chain of encirclement on the son. In softe of tennerally excesses, the section by land were never completely excessful; the attempt to break through on the see was not sad crushed in a single summer's

afternoon, and the repulse was so complete that the untire was never repeated.

If Admiral Jefficor had lost the battle of Jutiand the Aillies would have lost the war. If the British had coins for resembly flatest over my headest sales been so budy crippled as to lose the command of the we and the German battletrainers and light crubers had passed cut us to the high sees, the flow of year tions, ned and supplies from America would have crewed and we abould have been unable to hand a

state spider to France

In that dramatic moment when Jeilices are the wherrean battle feet befree him, he had to make a quick Two courses were open; one to close in, "these the terretors," and overwhele the energy with his superior force; the other was to fight a long-range engagement, beyond the resch of the torpeds, and here the energy back behind his nine feels. To first absennotice, because of the bad visibility and the latmo of the hour, meent a dog fight, in the orchierte so chances of which he might here het a large part of his fact. He chose the wiser, if loss spectacular, plan To those who are interested in this greatest fight of all moved history we consumed the third volume of the Official Mistery of the Great War, which has your been published under the title "Naval Operations." this returns, with the sid of fairty-six maps, giving the relative positions of the Fritish and German Seet at an many different times during the day and sided date. ing, the student of the war can form his own to sent of the battle and the testical shill d by Admiral Jelling and Admiral Bober.

Here and There

uting events of July, 1923, was the International Conference on Health Problems in Treeteni America. This was held in Kingons, Japanica. and attracked by contact observings, recovers and beath engineers from all parts of the world. The Supr propinal diseases which are at this time the center of attack, and which comprise by for the major part of the trenical severce as it exists today, are majoria. amelic dresslery, heckworm and yellow from Ry exponsitrated tests work between physicisms of all orgatries and all climes, there is made resultin on incorporaneer in economic conditions, in circumstance of life and in public health throughout the tropical regions of the sects. Titled and descented Englishmen, grown gray in exacting service; quick nervous dynamic Latit Americans best on quickly cleaning up their districts; Itsilan sayunts to whom the discover of the Durk Contisent are as an open book; French extental decises; scadesic Gersus professors; christes, research ases, biologists and monorrises from the United Statesall these pathered in Appales to discuss the problems of overrals interest untality out of the effort he make

A MONG the distinguished gentlemen who took pu A in this conference, a place of prime importance was enjoyed by Dr. F. G. Banting of Toronio, whose recent discovery of insulin was him international faces. Insails as our readers will need in the draw that he new helper given for disputes. It is not presented described as a cure: It is purely a sufficilly, which partly arouse the discharge of sugar said partly pergains the patient to live and exist an almost normal diet to splin of the diabetic condition. But to the sufferers from this disease it affords an effectiveness of treatment and on expectation of enhancing life for

the trapics safer dwelling piaces allke for the white

become that remotionally habit unt to there A 8 replanting the international character of the conference, are give together with the Bazting's Bloomer that of Dr. Hitlero Negachi, of the Bockefeller Institute of New York. Dr. Naguchi has freight yellow fever in Brastl, and was able to skyw the conference a wenderful

methodological distance of his propringers and his respite. On these films the genne. tiele against a dark field, carry on their malefeent life-croic, while Dr. Noguchi explains the several stages and sets forth his deductions. It is largely through his own work that Dr. Nagachi is able to tell the physicians from tregioni countries that rate polices from in almost as exthat as the dods; that we may ran into sporadic coses, but that never again will the "black

south, and spirittingly spin belongstone on cars out shot-gan patrols to protect southern cities against the ranks of the indection. Indeed, Dr. Noguchi shows by his works that he has faith in the label "Exceled which he has not on the yellow fewer green; for his major interest new lies in another field. He is engaged at present in a revolutionary method for destroying pathogenic perms by utilising the actinic mays of the

sun in exchanging with cersain chesical agracies.

THE MED'S THESE STATES mode of the air-muli by the males of the arrests of the tain offender was known to have boarded the train for St. Louis, and, for more record specified, conditions was fell. that he would not have the rain until be get there. The age for his arrest was often mailed in the St. colical separation between the two

Louis police, accompanied by a very necessary photo graph-necessity, because the min was without a po-lier record and therefore unknown to the St. Louis depetives. Three decurrents were resided over to New Tork, get about the Chicago nedi pinte, and trate-Served from Chicago to St. Lords by regular train. Tary arrived in the Montal City conductably alread of the victio, who was district very cost taken about to be got at the station by an errecting party than entroed. Presentably we shall get the transmission of photographs for wire down, more few to each a fine belot that the identification of a stranger in a stranger tives can be thus effected—indeed, the other reason with It couldn't be done today would be the absence of the measury scaling and recording apparatus at the times and in the places when needed. But actual service of a warrants in separations calling the the related discutiett, and apparently the already hitrodays resultil-

tion here that the un considerate wide of attainment

by any other means on they are need and intriguing. Title perturbility between and the describes of other in one sheet which a good drail has been writtenmuch of it name namedon, of every, but much having a pretty mild foundation in fact. There even exists in the politic telesis a neutre definite "detective trans" and an will proportion to much such closely to this type than the same police sireth who has graduated from a paintings's leaf

to the dignity of plain circles. That the popular notice is not necessarily correct will appear from the spaceol periods of Dr. Victor Bulliance the 'Sharban Malaco of Person's school comes rived to the absolute more. The emerging indignity would exen to be for Habbanar's furnifull of bein, who even could brautes a real five detective with whitees and brand like that? Tot the Bestur is wer much a real, live detective, being one of the emisself

medalists in the wirestay study of crane whose work has done so much to not Extype about of the United States in this field. The numberies habby to the critical study of the bale of non and entrack. It spowers that it is not since in firther that the numbers, the safe-heesker or the bendlt leaves bits of lade around the scene of his crime. Hair of ware description. the padding of his rout or from none offer source, is really one of the most likely titings in the war of a che for which

ctive can hope. And Dr. Helthauer, with his personner and his moviel translation, is admirable ted to make the most of these class when they corur. A NOTHER windsom of tradition confronts as with the portrait of Mr. A. J. Benor, of the U. S. Department of Justice. Mr. Reports occasily a seleptific retire, and his face, though onite different from Dr. Batthaner's, in equally for presented from that pre-

exited by the tradition of detector fiction. His job is the care of Chole Sam's collection of finger prints, and he has just added the 600,000th specimen to his files. The collection was recently transferred from Fort Laurementh prime to Washington. It is in fact an international gallery of the followers of the professions of the light fager and the heavy flat, armagraphic being now in operation whereby all correct points from tirent Britisin, Prepos, Iveneric, Argentino, Constiand Meeting make to Mr. Homes and are filed with the decemble entout. With each west interpolated pollectes of regulah finger prints, it is becoming more and more difficult for a second off-odor to get away with the penalty due a first off-ow, no matter what the groPSTCHIC rewards the world over is a lawny least though the death of Dr. Ottoture tiring Director of the Institut Metapagelogue Intersetteend to Paris, and the men tay spirit of excineral toenglation in the field to sa end greater extrat than his 10). No details have had

cabled to this side, broad the





ticky is known to our readers through his article in our loos of November last, describing his work with the arthur Electi, at where sillings were elected the paraffin shells from alleged pasterialized hands His principal published more was, in its tinglish trans lation, excitive "From the Disconstitute to the Conerious." A past posts volume, as pri untomolated, "Z'Ertoplasmir et la Clearupperc," leings together his meet important recers that have assured in the Joymen of the Jacobiat

traveling from, appearently, some point in Poland to

Paris, fell with fatal results to the possenger. De-

RY was of general characterization of I'r ticks, we can do no better than courte Dr. Welter Promitte Detacte months in the American Journal of Physicist Berend, "Or ficier was an inspection.

for who, because of his general philoso phical and wicerife intelligence, his in theiry and his intro-e contribute, beauty an aftern and an expedier when other investigation comes efferd to regiert, even though they may come for along of adopting all of his containing. Firesty convinces of the reality of empions, he set did not think it a proof of spirit varying, over thrugh he appeared on other grounds to four that decreas." Dr. Geler's peritself accounted on this man three nomine upo. Alsone

nenctiontally with his death, so we do not report it

N interesting mostletty in the current of min writt was appropried by Dr. Googe P Kuns, of New York its executive reporting to the Versity complete of the British Association for the Advancement of Science According to Mr. Keps, more than a handred dissemble have been found to shortel drift in Oble Indiana, Michigan and Wiscoste. The electrostopes of these finds have always been such as to indicate that the beliefed and widely scattered getse had a comnon origin, and Dr. Kunn strongly suggress that there exists a prosquably, rich store of distribut some where in Orando, from which these warderers were broken off and carried away in various directions by the cluder. Oncot them tailated discussio was a fire stone of he less than sevention carety discovered by and diggers in Whomes, Apolier of thirty carety came from an Ostario gravei pit. The and of lit-Kuna's arguiver, however, consists in the very strong implication that the paths taken by all these wandered could be roughly travel lack; and that the author pecket would be freed amorealmately at the interest tion of those reconstructed lives of travel. In its south

em morecast, says the liveler, the platter mips have shavel of the top of the discount-bearing clay and carried the stones along, depositing them at randon along its course. The difficulty, honover, is that the reconstruction of the original notice can be rely up neurinose: and that as reconstructed they do not bring and minds at a single taint on they should but how the Gaussia sweet with a consumitively large term tern, of which all that he can par to that the log deposit of spackiers neglit to be presented white it Here, then, is a chance for the prospector who doesn't mind a heavy gentle!



240

The Failure of Metals by Fatigue

Why Steel and Iron Give Way Under Repetition of Relatively Slight Stresses

DiffAM parts of engineetic architecture and parts of the parts of the region of the parts of the

many years. Beefoly aftermethy attrees of this hind are well known to employee as perturbated proceedings of the type of father known as "intigge fathers." The attraction to which the esserabil a vellage fathers." The states to which the esserabil a vellage fathers. The states to which the esserabil a vellage fathers. It was been to state the state of the tracking the state of the limit of the state of the This father fathers, is a particular laterest to the state of state of the s

andon settleme, he is his recently use of Mal-own mechanism and the clitic down of world by mentile design, ingress he higher strones upon individua parts that was more than the contract them higher strones have here and by the threshold of the three higher strones upon the contract them higher strones have here and by the threshold of the contract them higher strones have here and the contract them higher strones have here and the contract them higher strones have here and the contract them have also as a second and the contract them have been also as a second of the contract them. But the contract the contract them have been also as a second and the contract them have been also as a second of the contract them have been also the contract them have been a second of the contract them have been also as a second and the contract them have been a second of the contract them have been and the contract them have been a second of the contract them have been as a second and the contract them have been a second of the contract them have been as a second and the contract them have been a second of the contract them have been as a seco

vanadizan steels used in agio construction are a case in point. Yet the suggester is constructed brought two touch with accurate the construction of the construction of the construction of the university of the construction of the university representation of the university place, in whether the construction of the university of the construction of the foreign of

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more recent research has offered abundant pend of the

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sail serve le instaliurie proteste, fins the direction of stip in revent (no. of the "signif" layer increase at each revent, austi ultimately it is expensed out from the surface of stip. The "signif" this revenue cil it is, because it behave quite differently print stip of manufaction of the significant control and manufaction of the significant city, and when it is expensed out, it best soilly and when it is expensed out, it is significant to the significant city. The significant city of the significant city. The effects of the significant city, and city out throw it is significant.

his by these magnets, putting on opposite sides of a stratutes A. or treatmiller for the lower sell of the first feet glose 7.7 the sayor and is grapped in a Notice of the property of the strategies of the stagents and adjuntable less it employ consents will fine website obsess which form part of the strategies are not obsess which first part of the part of the strategies of the strategies of the part of the strategies of the strategies of the late. The strategies when the strategies is to the strategies of the strategies of the time. The strategies construct and consecting red to a side or hearings, and the models is therefore size in the operation. If there have had sized to the operation. If there have had part of the speed of the althosistic at saids the consensus.

tion. The vibrical exercises and connecting roles as delicated in relations in the residue in the relation in the relation in the relation is the relation in the relation in the relation in the relation is the relation in the relation in the relation in the relation is relative to the relation in the relation of the relation of the relation of the relation of the relation in the relation of the relation in the relation of the relation in the relation is related in vitil. The explanation is different in the relation of the relation in th

The North Bell ton basis in Api and along time, is all table

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This action, of which every sings can be closely historic state the microscopis. In our acceptate of the centre explainable of hittings follow. The present the closes state is reversed, the smaller will be described of reversal to describe. There must be a plott, harrow, where there are no explained aglented by the plott states of the microscopic and the process of the process o

All the state of the state of the state has been the subject of each meant, and multies type of machine for olding the testing have been offered. These which deposit ones the new of centrary released like for the contract of the state of the state of the state of the state of the subject of the state of the subject of the state of the subject of the state of the state of the subject of the state of the st

ion's necessarily consume much line; and susceime the load in purity in the nature of a heeding stream rather than certainly a longitudistic dee. The latter forms of profiles for attransition-element institute, the latter annotates of which a diagram; I stown. The action of the markets depends on a pill of elementary, it and X, supplied with two-plant current from a small admiration. The forces potential 

STRIAN TOMB, ANTEDATING TRAT OF THE EGYPTIAN EING, TUTANEHAMEN, RETEALED TO THE ARCHADOLOGIST BY AN ACCIDENTAL EXCE FALL (See facing part)



What the Shoe Reveals About the Foot

How Uneven Wear on Soles and Uppers Serves as an Indication of Foot Defects and Weaknesses

By Homilton M. Wright



O WENTER OF the bosses find have been been a subleri of interest to rethopolish sterel differences in first, housewer, have taske it extremely difficult to com just the average distribution of weight toxic the saterier, saldfile, and preperty pers of the fact when the budy's weight is buy-seed

parts of the fact when the body's weight in luxumed specific. It is correspondingly difficult to exclusion the presence searched specific like, above at the points of evolution the glowers in secretal. The resider will then in secretal. The resider weight to the secretal control of the secretary of the season's in meeting weight of the season's like the secretary of the La Doors, Math., Mach. Prior Linco-comman, Mathell shorest Octors, Old. my, which is upopertionably our of the freeziont eventsbathers contemporary Benefiter on Sect. entisperiory mercitor on the et enthertic thought upon the subject but gives a parthemetical status of wight distribution to

determined in group studies.

It is not assential here to go exhaustively into the shalk is ripped, you may expect to this a condition of kuginofital and weakness, except question of weight distribution or pressures exerted by the fact when bracker the veright of the leafs. The

suchabled forces earted through the feet are gen-erally recognized. Within certain general limitations It is specifie to point out first defects and weaker stabbed off. which are indicated by observed wear on the show this noticed of preliminary flagments will at one recognized by estimatelies as presenting un-interesting statements of the way in which an average group of persons neglect their feet, the summeries of fred weaknesses that are becaused by the condition of the above will be stortling to the assenge layoung. cursed by weak arch or flat fiel, are not to wear fledt shore to Such a summation has recently less compiled by Dr. William M. Scholl, the coll-known fast orthogolist, to the existing to small pressure. When we are inhelied for the pletographs on this While intended so a guide in since fitting, it is ally a needing connectory on the providence of first defects training the en doubt to serial corner world as poor since fitting, builts shared stores, occupations inner hieder of the arch causes regulated in work feet massies and strein on the feet, and similar factors too transference to mention. A furning solds will right the shape of the stare the show sensit and scretch

Men, women and children, and reportally women, with turned book, resided country, bent there stands Aled and covered mayor, aligned and pein joints, and crooked and work down here stay seek in every city. These are size conditions re-ting from that conditions. It is natural to from a or self spot and this results in your beissing the foor in welking. An stake that the terrand the We find defects in the size whose origin may be

secribed to the fact that the securies in good condition. Prohave they have projected to over cise there properly, or have strate-of or weakened the number of the her though constant stronting in one position in their daily work. Many complaints are board from pact service given by the sixes purchased, kying excelorable en-nhade on poor material became the show do not held their shape and had workmanable on arrival the stretching and giving away of certain season and stitching Yet, if a careful analysis is und to be consoled, in many cases

that the exceptaints can be true



least possible pressure upon the affirmed great too jetze. What yes press upon the sensitive spot, the while body responds to the pulls promupe which the derival spid per the bridt. Chromerically and per-haps com emiclarity, the posteri is risinged to until preeding down man the tender met. Communically

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Nitrology at the heef is also the Propentity to a week

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and low above being at the sides. They are not see

If the have a tainful even you do not walk a

very directly to that defects and that we One one heart a great deal about first by the condi-tion of the shoet, by scrutishing such point of bearing the tread or galf of the swarm, the condition of the control and of the shock, and by examination of the inner wie of the above, when, of course, the glass month be removed. The inner sole is a proupt means of identificative of memorage flag prophies. A week arch is frequently indicated in the inner sele. If depressing an

found in the liner we'r at the ends of the fifth, fourth and third toes you can look for a weakened arch. If depressions are found in the con-ter of the liner sale occuss the bell of the flot, you may expert to fail metatorial weekness where one or more of the surinternal briefs have became depressed and eligitity the placed. This condition may also be rouled by the oxier man wearing though or the same webs

in one of messally high unther where this would not To examine: People whose stone are short fre-countly make indentations in the tater cap of the be-of the slore; the end of the toe of the sole in untaily

usight to appeals gife or on the last, so as he which prosests. Propie with business and en-larged no plants, which may be

People with week unkine and fet feet often wear off the latter harder of the basis, owing to the rerebalancing of the weight on the inter leader of the occu-Propin having meintamajds, often with pain in the forward part of the foot caused by a weak-ened unnetier (transvettee) and at the hell of the fact, are set to spread the spream of the sine are the respide edge of the min. The hall of the fact shaply factoms set. They freakly at test that to show seems to hold its shape.

by head, a method that so

Bugs Which Will Not Take Pols N experiments conducted in apple orchards in wes ern New York by the entrancinglate of the New Yor I see New York by the economissions or the New York by the State Engagement Northin at General, N. Y., R was found that when the appraising to control applies was found from from the buy of the speary stark the results were quite americal, due to the fact that the basects conquite mineratin, day to the fact that the Superior companied on the lower heatches of the Irose where the spray minture failed to reach them. But when the spraying was done from the ground and under the trees practically copied extented of the posts was accomplained. A pressure set the spray task of 200 pounds per square lated in sued in order to strainly substray there yand heater that the chall cover completely support that the contract of he surfaces it hits with a thin but effective file the surfaces it hits with a thin but offective flux. Aphilds are community citiled plant like. There are several striction of them. One writery seems to explo-t them to be a surface of the service of the service thank a service of the second of the service of the service of the service of the second of the service of the service of the service of the second of the service of the service of the service of the second of the service of the servi surface of the leaf is covered, the aphilio being period in so tightly that not one per cent of the surface of the leaf any he seen. They give to the undereide of the lead a graylet, waxy appearance which as closer consti-nation is seen to be due to their own natural color.

Tayou as seen to so one to their own instruct cour. They cannot be shaken of mer are they more that new porterly discouraged by rough treatment. But they prome marginally congress. Stricten brooks of these tenders may be batched in a stage. season, the method of realth tion being known as parthese sis, is which an imperfect for harched from an imperior retain-harched from an egr layed by a perfect female goes en reproducing its kind for a bussier of genera-tions without renewed inspregnatist. The baly aphile cope as fast that were it not for the vari-up checks implied by the balance of nature the whole world would wee be filled with plant lice. The censer the cabbage leaves to curl, not upward but downward. In fact

in many cases these our into a surt of mill so that the soulds are reon the stores of relia to that the spitits are pro-bered do neigh from the relia, but from the spray which is itemeded to still them. During a prolonged dresight their therease it so great that the colleges plant is either prevented from growing or included up all becomes a ran. The only provided of arting at these completely is to hire a loy to rea-solute the versa of the error part of some the corridor lines where the versa of the error part of some the corridor lines are the versa of the error part of some the corridor lines are the versa of the error part of some the corridor lines are the versa of the error part of some the corridor lines are the versa of the error part of the err

of bug Ansarica.

Tokuma of the sort used to all versus and in their set the follows of paints of not even cases and in secondards. He poliuse could be got particulared they would easily be blind, but these creations are the sound to be allowed to the country of the most paint of the sarries of the less wises clear to no points and the places. They that their recordance therein the places are the less wises clear to no explains why only because the set if the less along the places. They there there is not explains why only points about the file. Many present here this cleares here the file. bur A pointes do net till them. Many furnere here tirist i ment of picken spury in order to till agidab, her vicin can secondar yathe a non-pickenson done of while o samp will very affectively do the work. But it can any will very affectively do the work. But it can extend, but the spirit set over two body. This it he points of the little year, and marketen it, for it pair its assessment surprass perspect households to posses. The assessment half year in supply through the posses. The assessment half for the assessment for theoristic the su-required front. More the follage, as observed by it decises Suppressed halfum in load with again ter-dentse Suppressed halfum in load with again ter-

COT SOM AN regaing cato the shore or tearing from the sea bed. In every in up from the see bed. It every instance if the captain had been apprised of the sectual depth of the water the disaster would not have occurred. It is true that he could have taken avaisifing with the head, but that operation would have en-tabled electing down or over simpling the mount. Not a life matter of seel. Not a big matter, one would alt in view of the risk of hitting the doug when in harrow waters and smean range currents which are liable to drive tensel off her course. Tet, instead to Tet. Indeed of king everals of the depth under such fithes it to untenishing how often deendence is pisced on apparent distances, to recognition of a light or the modition the recognition of a light of the position as found by dead reckeding; with the re-sult that ships are not infraquently piled up on sonds of rocks when they aught to

proceding sufety in deep water It would seem that an instrument is wanted which will give a continuous indirection of the depth while a resent in approaching hand at full speed, and this is exactly what a desire does, that loss es taxested by a littlets plint. Capealla Janne State.

On budden of the Utertestion men who know saything about name gume will recognize the range-dister in death-finder shows diagrammentosity the applied to an ocean siner. On the left is a searchilds which projects a beam of light through a election window of thick gians in the ship's betters. This beam is directed straight downwards and products a spot of light on the bottom of the sea.

A supervisive will be madel before the fate, which when cheed comple rute off the opening in the bottom of the the skip from Booding if the glass in the window should be broken. At a measured distance to the right in so observation window in the speer side

of a gap-tectal distriber, which is open

to the sea at the lection and cretains a fightened tole tempted on transfers. One true breaths through the side of the chamber and is firled with a lever to move the tube, while a pointer is pro with a swar in move the tank, with a patter is pre-rided to show the rargh of the take with the hi-minuted. When the rule is directed on the spot of light, this angle equilies the operator to calculate the distance away of the ex bottom, i.e., the death. It is a since elies in right-angled triangles of which the length of the base is known and the ungle at each end being 80 degrees, while the other is shown by the pointer on the trumpion. From these particulars it is

easy to work out the length of the perpendicular (the beam of light). There is, leavever, he need to go with this calculation every time the depth is taken; wither a table of draths corresponding to different anger is propored, or the depths are marked on the angles to proports, or collaboration for distinct of degrees. As described above, Capania Burnis depth-finder beam dated to the Type plat-basis, "Queen C the May beam dated to the Type plat-basis," Queen C the May beam dated to the Type plat-basis beam failure.

sufferredo ven bas pair and for observation one (the base of the gle) is 31 feet 5 inches, he up to "15 fathers from by this device ON on at the ob

w to the ch le



Using the principle of the range-finder to get so

ree and read the angle in the chart-rees. All that is needed of the officer on match will be to look down the rate and more the mirror until he seen the spet of light, when the sage will at more give him the depth.

Watch Jeweb

A WATCH protected country precion stores to are worthy of the hausthe lower and the belance wheel gloods always ran in bearings made out of jews-tion the policie—the usus of the lover which transies the chrular nation of the everye wheel, have the wilto-ter method of the belance—and the rate site, the site in the miles of a lover staff which arm in the fork of the lever and receives the inquise from the exceptions are generally made of hard ever. In hist-gred watches, the bearings of the entire watch more are involved. The best grade jewels are made

per grade, of parties, said

the lower grade of ordinary rock crystal. There is a great deal of papelar sale undenstanding us to what the fewels of a watch actually are. They are the points in which the pivots run, and they much be made of the firms material if the watch to give good secrice. seem to twenty-there of their points of jeweis in a watch, and unless they are of good quality and fit the wheel-pivots per good quality and at the waterprove per Section the watch will be a post time keeper even if it does run Jewele in remeable settings or so

consumity said today that they are a stands write with ward material designs The quality and workreatship of them jount writings ratios, of course, and the water's requirer, on a rule, her to for one which is perfect. Any setting that has the least out of cruter any three as nent or goar out of proper sits teent and change it so much as to disturb entire adjustment of the watch Often u elight bump will bend a pivet; the words continues to run, and the sweet of the match forgets all about the fall. Turn in a week or so, the watch stops. The jurge jell, as the case may have been lent a recall plant, but not expend to stor The pivot resolves in its ; settling out of the true center, until it be comes work and has no be real or of this part are percentally are happen to watches were on the wrist. If the weight a place where a watch could he next to reside the survivette needes of arresty shocks the wrist, which is to always being moved rapidly and stopp entickly would doubtlow receive the cl Many those a busy will creek a Jewand other the world will confine to run When a jewel in crarbed, it heaves a reagi other, and the pivot revolving against this cracked edge of the jewel in som cut. Then, instead of a new jewel, the watch

man require both-s place and a fewer. Handling Grain in Lighter Harbors T the port of Libertick up the Shub

A The peri of Little provider condition exist which make the unleading of grestips a problem that has been selved in an incovering matther. At the Linewick docks the height of the water will not permit the university of ships spill they have here relieved of curt of their cures. A exercisity curstrayted mosel currying a prestable elevator ar ment ments the beneating severie at a point 16 mile down the river and part of the grain surgo is to to a burge which is then brend to the deck. By this method the grain tweet is lightened of enough of its argo to permit its progress on up the river.

The unequestic plant handles 190 tons an hour by ments of a saction plant and 120 tons an hour by a resultined blending and suction device. Grain is drawn from the cause skip and deposited in a receiver in the center of the tessel, whether it flows into a tipper seal. The seal is located just below the deck and detirent the grain into a steel lingues. A short from this b freels the grain into a clasin true become elevator. I

sistator the gride goes through automatic weigh

the desires and masses he results of a second had

restring into a large, Al alternative delivery is arranged as the grain very be admitted into nices through which a rages turough which a vacuum pump exhausts and the grain is then and the grain is three smother repel for trans porting to the dock. Still spother alternative system creatists of a so-rat regard on that the recessor of the hopper run be drawn of this sarks the veleter for checking the accuracy of the automatic scales.

years to a tend own

Ira work and expense ha screens of grate is no



ighter for heading grain and other bulk or rbor at Limerick, where loaded ahips

Turning the Wheels of the Railroad: Steam Locomotives

I dred years ago, the steam lecounties has evalued little a manager of shed, drayed with wore 15,000 parts life a minister of short, drayed with wave talken parts such of which must be transported up and down the railroad, imperced with unriving regularity and re-placed frequently. These resolver water from 200 to 400 tokes in weight, and do well if they shou there or four times their weight of puping freight on a comparatively level road. If efficiently handled a steam becausing only can a grow revolute a little case that the cost in a year, which is a matter of \$65,000 or fields. As fast on the in-level processor stress location live is extended, the citizen is reached in the Montatire is convened, the climar is reached in the Monar-tide type forwards with the dath tage drivers such \$2 fortes in distorter, requisite of heating tender stad conclus weighting \$70 form over manifolds, fesser and plain at high speed for a deletate of \$10 miles! This is the performance of the Low Angeles Limited of the Union Pariffor Railroad.

day. The carefully prepared mati-tim of the leading method of the life of the average some location to extend to ten the large forming forming recognition to extend speed its production work, namely, the tending of care. The between of the time which the queed steem becomes two speeds in the treatient, in angion because and so on its tono-productive time, not to neutron the large periods upon in the regard whops. Thisting the Clear I referreds in the Culted States during 1821, the average reaccedurity tips of freight increasities the twenty designation time of freight inconsisting nanotized is nonzenion none than II hower out of the 24; hence the locatestime were life and not estably conditions of the time. In fact, during this time they are not only non-productive, but are actually conting the relineds contineable some of meney for attention and find in keeping them hat and otherwise taking care of them at terminals. Puring the same year the average monthly milesge of freight learnessines in active service on all classes of culturals was only about 2600 miles. It is rather surprising to from that the usual absent

and for passenger becometree only 4100 miles, at perminsing 40 per cent of the senings becomed-tive is spent with the mechanish department, and for remains projects, reminds, in somethy bolds want and its annual results of 30 to 30 days for complexes. The large is sufficiently and the contraction of the con-lection of the contraction of the first in the con-traction of the contraction of the first in the con-traction of the contraction of the first in the con-traction of the contraction of the contraction in the filters to remark them. Set if the contraction is forther than the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction in the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the con-traction of the contraction of the contraction of the contraction of the con-traction of the contraction of the con

The reverse life of the risem borocorde is from differe to restrict pears, and if province our is given in the replacement of parts, it should constanting price activationally to its proper to be the real daugest from the related in the parts to be the real daugest from the real results of the real results of the real results are determined by the results of the r



AMPROF STORMS TO require the heavier type im





Pennyivania Railrond's standard heavy freight locatestre. Wought in working order, with ten-der, 182,160 pounds. Driving wheels 62 inches in diameter. Starting fractive effort, 86,021 pounds. The certime later shows was built by the Baldwin setive Works trees the Pennsylvania Bail road design. Many incometrees of this type he tesign. Nasy inconstines of this type he seen constructed by the Pennsylvania Be rand at the Altonia Warks





Turning the Wheels of the Railroad: Electricity and Gasoline

A DMITTING that the steam incountry is an advahever adones an opportunity to lead, all the while cost-ing the relimeds large sums of money for feel, main-tenance and operating staff, the fact reveales that the strain issued with the strain of the strain and the strain issued with the strain and again it has been threatened by the electric beamster, white all the facts and figures are in, the decident of the cultimost is to create the securi issuestive as the good old reliable motive power, while employing electric becreatives and untitable-cult inside photing electric heconsitive and untilitationals trains for those excitons entering large cities and for subscripts service. Also, rullemade have found electrification ac-continguous in leadilities intere water prove to abou-dant and cheeg, with eval to receive and expension. The accompanying collection of severa, electric and processor willing electric of a typical Assertion railmost.

the tide testates the Pennsylvania, gives some idea of the wife variety of services to be lumified gird the conthe water variety of services to be leadeded and the cur-responding types of rolling stock. Still, such types us ewitching incuratives and the scaller right-wheelers

for Engaris ligar operation have not been alousy been for most of space.
The main application of electricity on the sa

power for militards is for these sections exacting and leaving large cities, where the session nationer is in in amided. Furthermore, over such sections there is one tain to be considerable solution made, and electric operation has a decided advantage to this type of words. For substitute works the stateball practice in to employ the multiple-said court, which has its untielecter meter and controlling equipment to continued with other similar consists to form a trails made the custom of a shade materiate. The first billy of the salitale-and train is remarkable. Not only out a train is made up of any muster of coorder the acceptance the flavouries of traffic, but such traffic acres to traffic acres of traffic acres on traffic acres on the traffic acre rous of ket thee for stops, as compared with the comparatively long stops of the lavous-tree-drawn train Electric beautifies see in larger a carriy, being need on a large furnier of brackers relievely. Where

sheritic learnantine be again eremented to compute and electrification becomes economically memi, despite the lessy investment in providing equipment, prest One thing certain about the electric becometive, and that is its siredy perfectative. At electer lessessite peer on working day after day with Bitle attention as resummed with the improved leveledby. It puts in a for greater master of working hours than the store becausite, and when it does happen to be idle, it is not consuming first ner then it require an engine even

The lost most in rational matter power is the gase to our Originally this type was fittle more than a meter less provided with flanged wheels, but it has notice for provided with Sanger where, but it has peteral little as the usual couch. Gas-disc cars are finding a real field of utility on the branch lines of the making a real test of unitary of the united since of the militarity, where the limits is too light to make strain or electric committee annihilable.

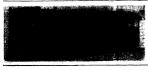
into a train controlled by a si





Entirely new type of electric locomotive. Highly standardized for general utility work. With high gear between switer and wheels, it operates as a high-speed passes-ger engine; with low gear, it develops great tractive power required for freight service Works on either alternating or direct car-Works on either allichsting or street cur-rent supply, with slight change in control apparatus. Weighs 408,000 pounds. De-nelspe starting tractive effect of 100,000 pounds in low goar and 54,000 pounds with





Bringing the Carboniferous Period Into the Greenhouse How an Artificial Supply of Carbon Dioxide Stimulates Plant Growth Far Beyond Normal

By Dr. Ernest Bode

ill coal age was a past weatherful period for the hannings development of all regilation. It was a time of extraordinar predificacy and and separabandance in the greath of plant life. Although there-

were reig a first types represented in this late from our got while the carbon is undefined into period of mal furnishes

the american happy of the then existing forms, state be rapidity of their provelly. strengly the branchestics that distant and pre-Meteric day, the way may relied by a dense the the wit ment ode and was one dell, shedge half or Montered disk, that the quest of day street high in the learners. When the said led statty disspared, note of the golden mys-round as yet track the steaming melabed Gree

sally the feg was tifted the converts eper until the east, in all its questor, stone down bathed the earth. The rays of the east worked, with an elegation of energy, upon the green cells of the young plant world and gave, from the six which was the expensionated with carbo divide, that carbo th, laday, is fromt in the lade of cont.

The green platts process a double "respiration," Dur-ing the day they give off caypes and take up carless distribe at night this process is recessed. Then ourgant is taken up and carbon distribe in given off. As went as is part is wated with a certain definite amount of air, the individual constituents of that air recent unchapts. The curion disclin used during the day is given off again at high. If curion distalls is now solded staring the day to the six or if some containing carbon divide to given, then an analysis taken of the sit at a layer date will show that against region The toking up of curion dicaids and the giving off of easure is a brown of metallation variety dependent upon a rettleberg of dualitate little artibets of respiration are necessary for the

They manifested each other although they are apparently the expense and amagaziness properties.

The various distributions off for the plant is produced. by the receivation of organic relatingues who is developed. This notation generates that take requirities in accompanied by a less weight, so that modely growing plants become de-cidedly lighter of math. But here it is reculler that were place where chierophyllogeneiting cells can obspace above contrasts that cated quite and incoeffately look these down sgain, burning then min curies direct and nater and as helping b and lower the question of feed produced weren to be appropriate to the common of green nion The purpose of this parsoling has not, as not, been fully established, but the camb is become piratics, opener is derived which is absolutely committed or the transfermation of the building material as well as for its growth. The contraction of argetic mearecards in the theory of the plant is demanded for the

Intended consequently fremend for the plant's well face are, in the main, rate colors directle and water with these sain desoired in a living back still face ther, the elements taken up in the plant are, primarily, couper, hydrogen, blimpen, seller phosphorus, peta-rian, calcium, magnesium, from th. The minn came ester without them. Then, two, quite a number of oth remote are found within the ti-see, of the plant in various proportions. These have been made up with water in the form of solls and are county deposited within its structure. Nevertially the new actions for first or feel for fertiliting agents. Furth substances are solicus, below, riborine, describe, beseine, manganese, shealarm, on

The leaves and the turds are the stelladicing second taking up the field increasery for the plant's greatly. The haves have they openings, most approximate the value exchange the hard as well as curious its saide are token. But then, two, these stought play

experience water taper. A for greater quantity of carino distable gar is taken sen of the air during the plant's used rapid growth than is given of as engage. The process of ambalistics upits the norther distrib a mid column consent the structure of the plant. the green

pholi and light agt of them It has taken up or obcarbon divide gue contide frem extrapic sold Two molecules of this cut hante and are taken to the plant und menufactured this furnic self, therefor ring it off as a

Two molecules of lorfo to resultand retris accepts and a street Nix molecules of forms a process of conferencies. on suiscie of State or new takes from the exper and the result irreted by a



 $B_i D$ (water) + (%, (garber distribe) = $B_i D A_i$ $2\Pi_i(t)_i = 2\Pi_i(t)_i$ (fortife arid) + G_i (expan). $2\Pi_i(t)_i = 2\Pi_i(t)$ (fortife arid) + G_i 4. 4CH,0 := CH_O, (crasses) + 4. 4CH,0 := CH_O, (crasses) + R,0. Runn on le crassered

the basic principle of pen-ficulty all other plant substagers. From this such ager sad cellalar, etc.or frank the flor and the unriette are renduced and of great imperiums separative. These time dates of compression and quite sufficient for the for Rective of all plant organa of a relations of oxygen and alreads and the imprefrond are cupetion in price firstly every place to the

word. In vience there is 'Il per out nitrogen, Il per west cappen, the per ext argan, this is this per ests curben divide and a very variable percentage of water vipor. The carbeits sold gas of the left is fire tone important than is evidenced by its emporantively admits ansesse. It is though both the nation district and the

water that the air is able to charge the dark, heat-giv ing rays of the spectrum into heat.

Thus it becomes self exident that carbon distribe in elty for all plant life If it were togethic to give the plant carbon displie, which is so operation for giow the pixal carbon discale, which is so constain for the development of the secretary, in some straigh and may way, then we should have a notice of feeding it directly interaging the bias. This is what the entropically single investion or Blook attempt to 60. The expectated were corried out in two exactly adminst procedures with the this special purpose. The broase were of the stand type,

has one was equipped for distributing cartest distribu-pes to the plants, while the other, hocking this device, was used in the nutral boxe. The results arbitred are as remarkable as they are experience.

The gas in preferred by the beller used to best the greenbranes. When the house is no be gaussel, the short ength of pipe leading to the fire is closed and the gas sength on pipe manager in the thin is chosen from the gas intel thomasis pipe. I so the two neutritions formal fact suit-side of the building. The gas possess through water and is particularly garified as Z. Hightly above the water in a greate of an which is placed code. H which is kept mainly a spray of water I. The mostle builder that of through 6 to the armet. The pensage of the gas through the first acrabber has partially cleaned it and new it passes from the top, through pipe 5 to the botten of the second acculiber. This is also filled with colo, but in second accuracy. This is not seen with cone, on in place of water, a noise neighbor $(N_{ij}(\Sigma)_i)$ is treed. It collects at G, passes through T hate tank E, is purposed at F to the top of the tank at 2 from where it is approprie owe the color II. The gue coming from the ten of the over the color II. The gas clining from the top of the second scrabber is new pure and is curried to the ren-ciator or passy II from where it is distributed through when is the providings. This upper also serves the pipes to the protibrate. plyes to the precisione. This pump are serves the purpose of bringing freed of inten the police, its action being searchest visities to that of a record durin. The place distributing the curious divides gas in the grantions are provided with labels at laterals of about a first, the discharge of the gas being offered

heat one feet above the plants. The plants are not containly supplied with gas, as It is only necessary to do this at intervals and in the morning house not more than 2 to 2 are cost of carbon morning hours not note that 2 is 2 per cell of carrier distribe needs to be precised. This precisely distribute When a larger quantity or percentage in precess, the beans must be alred, for otherwise the pinns will sicken. This patent process ufficient the gas which technique emajors my the fine and feeds this par, after it has been rifled, to the plants which thrive mervel

negatily about II parts in 10,000 but strong reddent exists that throughout the goodsald listory of the earth it has fluctuated considerably, with corre-influence on regulate life. According to T. C. betts, the known alternation of her and cold citrates was caused by a fluctuation in the carbon dioxide con-During periods of mess formation afficults rocks were exposed by evision and corbin distalle, as H.Co., combined with them in harpi ies, robbing the air of the dicates.

GERNANY has one or two ago an agree with Rossis by which first of Hugo Stinger rains the encius

Dest the draw where it is settiik comilitiens erlet. At this point approximat early hour in each directi

robber panesau te of blocks at h im better and one had there

celar flaps on one side and one flap on one said of the base of the block, which

fit into corresponding recesses in the have of the adjusting three. Drive spikes are crived through holes in the flags into the bridge flooring, or the special device used

oracrete mud frandattons. The blocks

laid to lot rabberted movet, uniting the blocks and helding them to the fron-

dation, making a water-digit roacting over the street or heldge. The sharpest horseshee colks or the heavy steel tires

makes to extend or mark on the more

a consect pourer, consent layer, parting block placer and a spilor, who fald the

first few bandwed at the rate of sixty square feet per hour.

As the bosons and wideless pose over the reliber-pared section, the lack of sales is at once nation, thus lack of sales is at once nation, thus showing the de-strictivity of this class of promote for streets around houghths, particular med-decome and high-class office buildings. first few hundred at the rate of sixty

External Water-Curtain for Sky-

The speed and scenary with which this rather pererast can be hid was exempli-fed by a crew of four bridge mechanics.

聚性等 经数点

nd, for quiet and long wear, on one of Beston's busy bridge The gre et Officeiro the pumper, a five engine. The descontrative shared from length; around these content. in the way of success of robber block consumer has

that the Clarkstoti Fire I separtures cut drive mater he is any any or survey or recover stock purcount has been the lastility to keep the blocks down, and is pre-vent them from creeping. Ownership in the fivurdation rought not accomplish the result. The rather paring blocks are constructed with two available. to the highest point of this heliding, 465 feet above On the word alde of the building the metro

Street |, the syrinkless are treath for does to the third. Furthermore, two windows on the Vine Street side to the east and two windows on the Fourth Street side to the porth are also larged to popular from

down from the seventreed four them to the night, or the read of the building

on that wide. (In the weath

side of the lediting, along

the alley-was (Bak

His make controlled by nalves, constitute the ex-letter synthicker system. Without audiciant water me aprimitive system is of much value. Provingsty investiinto more such to descriptor the quantity of water that would be affected for the building and

also the grantly that would be required to the property and large grantles in this territory. An scaple water supply was found, furnished by 2, 50 and 20-lack tustes on Taind, Vier and Raber Streets. efficiels gave assumptor that water margir would prove sufficient.

A six-in-it respecting was made on Fourth Street, the nature on Vibr Street, and also on Raher Street. Three six-lack then were run late the engine even, attocked to a loader and cross-connected to the present steam free pump of the hall-ing. The steam pump will pump 150 gai-len. of water a minute. An electric pump will formed 1800 gallies per mirror un-der l'oquant provers le case the better near should be fixeded, the elecpump, bound turby feet higher, could be logs in a thin so there are conside electric removeshess to the fire pures. The electric peng has a special system out to to texas any surplus mater from the

biller rece.
There are two states for depart steamy connection on Vine Street com-ing has the spoten to that the fre depertient on outnet on the eight 256-inch how lines and passy direct into the sprinkler system, if measure. From the discharge of the two passes or etreet con rillions for the fire department, an eight inch elser was run to the pipe gollery, known on the "10"s, door," and then into a bruder from which the water die te with the subside wall to the six forcelack feel pipes for the sprinkler system All feed paper use controlled by values in the plan sailory, so that only these aree sure for few perfection can be use in servan to project the west or the south

The sprinkler sprintige the turned door hemsed the window, which permits the piper in dusts. The branch piper from the feeder in the curvisis of the building ear tech and three-pas and all surjuiter specious are fed from three-quarter inch or larger pipe, The

sprinter outsits on the top lines are three-spirit inch, middle lines fromin-

obe-quarter first. An avenew rettlement working new ears of alway 50 posteds to

All of the pipes used as the resides of the building are of extra betty polyabted wreight less. All 6 tings and bangers are of the same material. The weight of the pipe on the outside of the building is approximately

pemás. The optimizer system of regular restance from the department panagers, and the building in thought to fire on the two subscribe

at protects one of Cincianati's big office build from five

scraper Protection

WHAT is declared to be the highest VV exterior sprinkler system above street level has been accordably installed et Christmani, Oblin, on the Union Control Life Insurance Dubling. Its secons of this spaces the building can be perfected on two exceeds sides from free that can start in adjoining buildings or leng across on allegency to the south known as Baker The experience gained in the Berling-ton Building fire in Chicago early in the spring of 1022 served as a warning to the

north planning this modern skyremper. In that has now from a castlated least imped ves an About street and extend the Butington Building, consuming the rep-tents of several force. In order to affect added security for the revents of the over-polar in the Christmati building. It was decided that in addition to the protection

eded by wire gives in windows and doors, an stether berriet, an en terior eprinkler system sixuld be tracalled to orner the window openings on the expected aldes of the build-

gives a two-boar tast One antequetter for

100

The Airplane Carrier "Hermes"

The First Ship Designed and Built Expressly for Airplane Service By Nauticus



Boy view of sirplane carrier "Herme EVENT of some gets in the blooms. saud execution returned surly this per when H. S. K. "Hermes" was placed to convenient on the state of t in consistency, for size is the life; saip in the world to have been designed and built materials as a featible airdinate. Note

require to plane, nation, and fitting.
On the filled dark there are various devices the classifier, the speed of landing alreptanes, superher with wind-femining pathons on all native sets. The authorist of landing planes on the dock of this olds probably differ to be instead evoyet. Deep these days the Post of the USS. "Language," and it need only be added that. with the new unfuly appliances new in use, dock landfive one by plints who have padequay special traini five dust by passes was more incomplete appears remains, if a heavy see water enabling it would be very different, however. There is growned agreement assuing manual relative that it is impossible with the present types of planne and currient, to effect derk landings at see unlies the weather conditions are formable. To that this. No could fir of machines in a second, it is true to be created and recover them, and if no least were within reach they would be best. This is a point often evertooked by these who contend that all future warbe serving under carriers flags, but with the exception from at men will be descinated by almost

because it would no longer be safe for places to it thereon. Not is this the only point in which the can is at a disselsentage compared with other high cuts. If a battleside or a cruiser were to assist which list after being tempeled or nitred, the day would not necessarily put it out of action. But if the confer were to receive electric tajury, and it was found impossible to resince the trian of the skip, she would be of no further use on that occurring, as atrylenes dur-not attempt to land on her inclined feek. It would not intensity to into on the intensit feet. It were therefore seen the security policy to held the greatest massive of sections currient instead of a few very large done, persisted the foreast can be made thereighly efficient for their database. The fact that the "libraries" has been attended to the Atlantic Fore, which is at present the senior economic in the British Navy, both catches the resource of the properties of the con-traints have means fitness for the more due has to depresent the search constant to the Derma Astr, the native her present fitness for the work she has to do. Although, at the present stage in the development of many accounting, the role of the simpless is to free part of the fighting first, there are not waiting also plane extinuises who risks for the large simples carrier the future concessed of the sea. Admiral Size for Instance, does not besitate to assert that a feet of

Score singlish corriers of the size of our converted ting cruises (30,000 bes displayment, 38 knots speed) each carrying free 40 to 50 bestern and fighting planes.

of the stricker cerrier. As a matter of fact, the str plane carriers with an exerce of 12 knets could stay indefinitely out of reach of the battleship unlook.

On the contrary, it must be remembered that havel action adjust themselves to pers conditions, and if the

ispe cuptler were developed on the scale sum

Admired Nitre It would be certain that every

would be more than a match for a feet of a force "Marylands" ment. 21 knets st each mounting eight 16-lack gens. By way of establishing his argument, he compliantees the fact that the extreme range of the H-land guns of the "Maryland to 22,000 parts, whereas the first of airplate car med its rugstize to the Now there can be as would be drupping their learning on. the leattle

ng how the hull flares from 70 feet beam at the ships long before the battle-slips could get within rung

and began the same year at Arastrong's yard on the Type. Her indding was drived in come queeze of priority being given to sessets for but lake the water unteet decknard, there to be made reads for sea

of the Japanese Tirebo which was feld down three years after the

verse is seen built origitally for other purposes and afterward outsected for their proveful

rtie. The "Hermes" was

designed curty in 1917 by Sir E T d'Experient, o Chief Constructed

Her principal characteristics are an follows: length brimes propositions. See five, over all, 1886 feet; bendth at waterlike, 38 feet over fight deck, 60 feet mean draft, 16% het; mennel displacement, 10,000 bon. Hie is propriet by turbines, with reduction pering, which drawing \$1,000 horsepower through twin pearing, there became a companies through twite shafts for a speed of 23 knots. Her believe are fixed with oil. The lites of the last show a merked de-partiere from correctional practice. With the object parties from regression practice. With the super-of giving the upper, or fight, slock the municipum area possible, the sides are boards therefore from the how for emotion of the object length, become which the fight deck is expected to stone frames us for an the stem, which it corriages by along 40 feet deck is of course, first to us and in end. It to usof once for the factors superstructure place stage fugget, bridges, and built up triped must. Bagid fire water of alsolate cettles are recented in stompton on the dwk below, where the heats the are housed; deck, one pair formant and the second pair shall erectory. Anti-terroris below any spring bate

seprent the "thermes" looks topolousy, her section at the interests would describe more in proportion to the leasure brough of her brookles. Doe, in fact, this appearance of invisitity is deceptive, for the weights carried above prehably are not observed. Having been earded above prehably for 2nd observed in second over well tried not so was, the result is reported to have shown because an excellent was lead, by the toward de-Select to that quality of straditions which is a size qua

Novel though she is in many ways, the "Hermes" does not represent the last word in the design of her particular species. For one thing, she is no sines. To partivals? species. For one thing, she is too new. To negler efficient negles with a battle first the carrie should have a speed usingle of at least eight limits over the average battledig, for the nature of her define compels her often to fall belief in order to recover her beeing simplesses, and unless she has sufficient as to prestake the fact size

it. For this result with Augerican and Japanese augerities been competities have about wis-den to designing their new curriers for a speed of store then 30 loves stration of the best diversings for ships of this type to all a subject of con-traverse. About thus the contrictions on aggregate tennage imposed by the Weskington Treaty, these are caper military argu-ments against building these stips of very large display-tant. They are, for ex-article, highly relateship to

world suffer to mat



Length, 166 feet. Breadth at waterline, 10 feet, at fight deck, 50 feet. Nicohomers, normal, 1886 bins. Hopeyconer, 41000. Speci, 25 benin. Airplane Carrier "Stennes" under way

ship would invesse in complement of contravers from the best force to at lower delta, and a now type would be built force to at lower delta, and a lower type would be built on the state of the state of a state of the st

weather, chosen by the attack. We are a long way, as yet, from the simplane dominance suggested by Adnical State.

Consensants and the Telephone

THAT a critisle religs in "to" is the most difficult.

TREAS evidence many in the common com

the table that the sexual, and see the fertion, factor is parameted in these tests.

The Latest and Largest Floating
Crane

Crane
THE New years as some over the final terms, the source are last of the soft battledgy. Singapory two med in places of the source parameters. The self-off department of the source parameter is not a source parameter to the source and the leaves as "I beer 25% instance and the leaves as "I beer 25% instance parameter and the street, was recovered, as that the deplacement of the crase is a section of the street, was recovered, as that the deplacement of the crase is of thirty 250 cars is reduced of 250 feet. At the time of its construction this was one of the large feeting crosse in

satistics.

Crease of larger especies, however, have been built, and by the coveriety of the building, Covana, the lots a Co. Life, of Cartials. Eagland, we present a photograph and particularly of a huge flowing crease which has been built and ellipsid to Japan. The Japanese crease can lift a

3. 300 box at a radius of 121 feet. Some years ago the interaction of the Delinio Activity in extra equals of 200mg 200 long tens at a radius of 200 feet. It will be seen that the based craze is by a considerable sourge the largest of the Secting type to exhibitence.
A cross cayable of 100mg 330 tens at a distance of A cross cayable of 100mg 330 tens at a distance.

A conic capable of lifting 300 ries at a distance of II five out from the control of its intraballo requires a long aptition to service the secondary shifting in particular 200 feet line. If the relative capable is a of the feet. These are larged-grow-; but on a saster of 10 feet. These are larged-grow-; but on a saster of the ties point in least), in facility capase as, the the work hasts do. It can lift a lead one hast sides and over one of the "10 in 100 mile all security to sparlled offigures have made that a second require the designers have made that a second point of the design, as in a feature of the design, as in the standard capable.

owage, so as to ensure the create to write; in revenue, waterways, or is any comparatively narrow speakings. The hands of 300 in 320 tens can be littled at the redit given, through a versional distance of 100 feet. For litting the malm heals, there are two independent likelys, each of 175 feet outputtle, and these many le-

and other negative or independent). Also, there he is sufficilly presente of 50 me, remaps of 50 me, temporal of the fine of 50 mes is sufficient produce, and this can lift a lead of 50 mes to a surfacil adjust of 50 met. There also hese provided an additional parchase of 50 mes, corried on a total produce in parchase of 50 mes, corried on a total produce in parchase of 50 mes, corried on a total observed in the time of the 50 mes o

When, and in the latter condition the bright to me, say of the cease is 200 feet. The resistance of the create through a shill office of 200 degrees in saids possible by nearable in your a sood installed, whose supering straints is thereughly throughout with that of the condition of the condition of the condition of the brend flame which contains the jian of the period of the super-fraction. The opposite cell of the lase of the other conditions of the condition of the same in connected in the office of the condition of the same in connected in the office of the condition of the condition of the same of the condition of the condition of the connected in the office of the condition of the connected in the office of the condition of the condition of the connected in the condition of the cond

in gains, formed at the rear force of the experiencion. The pain in the crossland engage weight across 14 inches in 48 source and 42 feet lens. These across accepted and 40 feet long. These across are delices through a train of greating, and as they return the crosslend is nated to nated vertically, bearing or relater the into the near wall of the superstructure is a large foliosi container, by which the regulate stability is given to the crate and tenters. Nevtally designed irretually on more personal for the two mein life. ing gran and the unaffery lifting gars. there existed the inverting of the peaka Silver head, if need to, to be be with precision at any speed between much controlled by a single operator, whose colin is basted introductly below the feet of the 2b. There is a nice deck feet of the 20. There is a wide dock provided with waiting similars, etc., to The period is wif-propried, before driven its a part of twispervey, even pound engines, drawing their strain from two single-rains believe, which serve also

in supply the singles for evening the critic.

It will be seen from the above riskill be great or the proportions of the critical rate in properties of the critical rate of the properties of the critical rate of the properties of the other for the properties of the properties of of criticing to the lower half. The work of criticing the great critical was a second picked at the logical rate of the lower half to the same type which he shown in the liberturies, at the following the first the land side.



Cahokia

St. Louis' Super-Plant for Electric Power By Oliver S. Arasa

IIK CAHOKIA power plant, located merr M. Lagis, No., supplies that city with its electricity. In the carity part of NGZ the place where the plant mee whith was just a weathyr shore. The new power dust we held to supply the ever-increase ing denied for curves for St. Louis and its environs. One of the engineers for the new plant Hinstrates this increase in consumption in the starement that notice ere two individual exercise in St. Louis, such of which sees more electricity than did the entire city at the time of the Louisians Purchase Expedition in St. Logic in 1974. Resides, plain everyday Jone Don, St. Logic bearwaite, concurre on three as much electrical

13' East to 20 years up. lergy gaw as 20 years ago. Is the Colodia plant, then, sufficiently about of the Is the Colonia plant, then, settlement used of the present devaned to constitute a reasonable articipation of the future? Apparently it is, for where St. Louis new Yes citizen lights every night, the Colonian plant above will hight saves then the sent a half utilize limine. and keep them lighted

It has been stated that Cubokin is the bergest pe is the over seven that the same is the surger power power or to the Minchelegot, Agails, in comparison with the Keckerk plant, which created good connect when it was created, the Caleita establishment in four these as

large as its Himselvings Conveyager. It three times the all-year-count power of Muscle Shoots, hig as the latter in. Calcula is an Ng structurally as it is It registes to size a 14-story etriculty. haliding extending for three endourse eits cits. Its lower levels go 30 feet below the surface of the Mississippi. Its stucks rise \$55 feet above the lattice of the stuck. and are as large in aerikanal area that a railroad train could now through their This gives an excellent marketure of this renders stant sensor plents, which consumes a two coal every helf-minute, or about 2880 tens in every working due of 24 hours. And it handles over \$90,000,000 gallens of water per day. Finally, when eather) 000,000 nore than St. Looks entire build ing hill for 1021 and 1622.
The Cabrida plant can absure be ex-

tarped; for it is bring hult in first we tions, and more can be sided up to the State of excession specular or as lets as the moral ware wildnise the existing atracture is muliable. However, every section is a unit in itself, and each call be operated quite independently of all the others Chindre is well located, next a great coal ficial-the shoulders in fact

out exhausting its interest is the way the Cabakin plant Ger its coal, which it burns in the restorcized facts The coal is lowered in a cluste to a long conveyor which parries it to a number revenibling an ordinary concrete talter. In this tracking of its on its war to concrete inter. In this hardest it is not its way to complete patertization, twing conded to a good time. On the way from the first stage of crossing to the meeted it gives through a big driet, which in the larests of rapid and mangerly manhoring and events of heat reasons the moisture content. to the privaters, give colored state, which gried it does to dust, From the life this dust is fed little. the freder, is a form to fact granulated that it fi In the furners, is this facts disord emotion, it stells specifically, he had need of heat to the white flower instead of the ordinary ideal; stocke from the get stacks, one can diverse only a frint while here properties fuel eliminates the need for benkel from When the those strikes the real the latter rough at size, respecting like the gas in the carbaneter of your agrounded. The conduction character of the Calculation furnaces are no less than three states in largest, as

The piets cutting ordinary building.
The piets cutting right 40,000 horogoner grace The past centure right entire course gase-sters, contrigues but a million delices spices, and weighting 425 tone each. They are created an Eddard concrete piles driven to bed rock. Between the ter-

blues and the piling are many feet of structural ex-crete-and-steel. The turbine speed to 1900 revolutions are minute, and the time of the backets have a linear ravel of 500 miles per longs, Energy Waste in Nature and Househ

Office is the earth is concensed, all available energy S is, directly or indirectly, decired from the sex. In spherical body, with a diameter of SSL500 miles, radi-ates incremently, just as it has for continue million of yours, light, best and other forces of energy in every direction. If we omedier that the earth, with a near discover of only 7000 talles, is in the room approx-nately \$4,00,000 talles direct from the sun, it become char that our plants revenue they at inthibetically must portion of the stell amount of energy radiates by the sun. The rest is dissipated through space with out being of beside to the earth; free the sundan ries it may be said to be wasted

Nate best, without whith separe life at our plant would be impossible, is of the greatest importance to would be impossible condition of the center, progress and rivilization. Nace uses has become to human

nt, showing what it will look like

being a mery 26 police to the long Illinois deposits heet and make it work for him be has there A feature about which much might be written with working equelity stockership. Only it comparatively nare cases does man politice the divert hast radiation of the san for transferreing then into mechanical work. of the san for transforming their missions of the san for transforming their miss uncertainty. He relies principally upon the two issues of salar has commission about the most increase of salar has the commission and salar principal many and the salar principal many and salar place products. Our methods of transforming held inpo mechanical or other forms of sangey are, after transformation or other forms of sangey are, after transformation and the salar products.

our memory or manufacturing that may meetance or other forms of energy are, undertaining, extraordly could and store may began to righter that the quantity of street beat on our plan in limited, he has denoted considerable study and re-marrix to the solitions of the position of presenting uthercovery washe as most as possible. A few ex-ceptes, taken from every-day life, will show how editer-located indeptificant the respirate are which we obtain from the use of heat, if congeneral with the treasmaking work which the same sampet of heat would be o

of accessibleting. To understand how the figures given below were ob-tained we must resemble that the thermal or have task to the speasing to below beguind to miss the suspen-jace of one inflamps of waiter one depose Contigueds. The works or among unit to the speasing of stempt or work resolved to III. a weight of one inflamps to the height of one most off. The activation for this small in high, mostling most believes. We must also resem-ber there are been of the transfer of the state of the time of the time of the state of the resem-ble the retain of unit is regard to III ring, on its other

words that the assentity of heat married to the oria, that the quality of heat regards to mee expension of one kilopram of water one degree Ce was, represente a quantity of energy or work caps ! lifting either me kg, to a leaght of 427 better

of litting office as in x, is a legal of diff motion of the to a begin of our confine for location for the latest confine for the confine for location of here is the execut in the confine for the confine out to the confine in the confine for the confine out at the confine in the confine for the confine out at every to lift the exists intime serieses in the confine out to the confine for the confine out at some. The confine out to the to the confine out to the confine out to the confine out to the to the confine out to the confine out to th

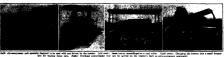
motion, which is approximately the beight of the Wash-lange is those figures are, they become pointry when lange as those figures are, the environment wants of energy which accompanies the transfer-tions of the quiet and undersuche work-ings of the wart forces of nutres. Let us ings of the wast forces of nature. Let us usesue that your yard has an area of about 500 segaror motors and that it covered with 15 cm, or about six toles of more and let. To melt this cover or show and let. To melt this cover and let will require 118590 heat units, equivalent to 48,206,000 take, weegy sufficient to run a seem-coard pas-sence train concentrately 1000 iro. with

The Thyrold Gland

The Thyrold Gland
This color agent in the thyridy second
tim is tellin, and when the descards
of the ledy are being soully xee a certain
smeart of ledits in kept it, reserve in a
collectal secretion streed in the reddes
of the gland. When the ledy makes
greater demands this reserve of supports.
Now the amount of ledds do reverve in the westeles, when the demends of the lody remain fairly excetant, depends entirely on the assessed present in the food. Sione foods contail more lotter than others. Che of the delf fraction of the thyrid is to prevent anti-basedorium; and the lotter of the like antibal while are select, more several from the cheese and the cheese and

It is of special interest to note the function of the

The second secon



one of the things that ingressity discress are to be done with the aid of the common farm tracter

hosis of the Farm To The Metamorphosis of the Farm Tractor NO swoter had a certify well-save type of farm N tweete appeared on the market than handwide of tremstraw were largined with those for concerting it into searching else. Perhaps the efficient sugination in the searching the registering time searching the registering traction and the registering traction in the registering traction in sight means that had been registered to put it not side value for more than the supplementary of the registering the registering the side value is not state. But the supplementary with the west appeared on such as the supplementary with the west as present of such contents with the west as present of such contents with the west as present of the such as the supplementary with the west as present of the such as the such a making use of the tractor for specific purposes other than furning is almost unbellevable. Most of them

re practical and have been worked set seriously.

The accommunities librarylines show five of these diffestions, all applied to one kind of mp, tractor. In some curve the original furg. tracter. In some cases the original tractic minimum to lazer in find, yet in each it is the same 16-barne-power unit. Changing it from a small locatesitie for hashing damp case and for potenti local track hashing sleeply involves reducing the wheels and setting the remaining body on a railway track. The mar wheels of of a fairway frace. The fear where of the tractor are supplicated by a large speecket wheel and the drive in direc-by means of a spreade chain. Palling cars with filtens penals frictional redstunce, this becometre, it is claimed by the magnifecturer, can draw a had of one the negative user, can crow a wan or one beginers toom on the level, and firsty-one took up a 1 per cent grade, the drawbar pull being 1500 prends.

Applier adoptation of the direct handing idea is the special trailer. In this case the tractor has been altered only to case the tractor has been altered out; to the senset of using rubber-tired wheels in place of the original wheels of ustal. A light wooden cub has been hulfs over the roar of the fractor as a reconstitute in the driver. The use of a trailing mention is leafting to be done while the power until in other wise consider. When the treather is realisted with a when corupted. When the tractic is equipped with a special high speed worn and gear in place of the star community supplied a speed of fifteen miles per loss: in goodble. The trailer attaches to the same drawler to

which a plow is attached when plowing is done on the farm.

The first control of the control of

r blade in from, both of which may be ele out of the way when not in one. On a house of a Tig-ton tractic file year auction weight about five bear the heavy wheele making to the difference

X-Ray Photographs of Mummles
RECENTLY, at the Field Museum of Natural His
tory in Calcage, in was from possible by a serie
of experiments to take X-ray photographs of museules The experiments to trans Array protegraphs or minimum Previous pagests when started by X-raying a group of Previous pagests backs fines the Section 8 Annua

These had been editored for the Worlds Colombian Superfittin, held in Chicago in 1800, and after have been in the presented of the Museum. To have unweapped in the personness of the Mineson. To have universities these manuary marks to according whether then one

Using the tractor on the road, with rabber-shad whocks, in connection with a aspecial trailer

tained objects of special interest would have mean tailed objects of special interfect would have seems that determine for exhibition priposes. By somes of the X-ray pictures it is possible to learn what has been buried with the body, thus determining before head whether or fact it he additionly to therwise the In the menery pade that for examined here been band once of certs, potters, speeds of they cantalally

shelis, lifts of certal, grand vessels, beads, clay figure explaints objects—on, its wone insistens, nothing ediftion to the range of objects found in the various brades it is justile to pother sounding deligite our crains the ups set, and condition of the bety structure of the body harded therein. The nature of injuries period during the indicidual's life is experience to record, and one can determine whether the decreased and

employ dirt or sand with a one-man out tring next of the tractor

been, ratios, articultie of vertees kinds, and other the none of the treplaining operations which were practi in Pers on the problement inhabitants have been dis-covered. In the Republic reflections manuscried care lawin, Jarkin, erworlden, gaselies, and one manning of a past of the 20th dynamy, about 500 H. C., have been indiagnaphed with very antifactory consider. The means of a mean two readingshoped in free sec-tions, beginning with the head, formidding a very clear nicture of the entire sisterion. Here we may expect to find fractions, pethological conditions, such as body regreen, richets, hydrocrykeltes, pycerizes, 225 caries of the teeth, all of width have been shown in the example.

mathe of unwrapped skrictal autorial to have been comme condition of disease seeing Egyptistes of most aprient tirees. feathers are very clearly shown. The pic-ture of the sammay of a gamele brings our the abelet-to with retaurable disth that of the crowdle also shows the box will to be in their proper relative posi-tions. The property of a jackst, which was wrapped with extreme cure, in short ture of that aginal, while the textile are trelal within is in a republica which lad cates that it had never been disturb since its wrappings had been placed in

Further investigations are to be made upon this sense close of material us well se upon receivment of marido, alchuste

A One-Man Power-Scraper Pull contractor levels; true question of diet or

is that Blustrated, which is drawn and operated by the reclinary form thereor. The purey which betts to the requirity form (before. The power when boths to the convents brokkle; if employs a worth and part to operate the resoluting draw. The genting is driven by a friction chirch with power taken from the both-pathy arms of the tractor. On the draws is estimated a finish a recent claim with power mans, from the second as A dach case that draules the even is sty desired position.

When leading the betten of the pan is about parallel. with the greats, std retails in the some relative position until fully inserts. This reduces the draw-bar pull of the senator to about Ni per cout of the best elicalization with any other purchase, according to the union. It also and devictory permits the scoop to Ell to paperty at every trip. When Blief, the

pon is strended to us ungle of about 15 degrees, and in this resilion the deliverruns to the damping point at a speed of from two to als, inlies per hour, accordi to circulation. The firt casses sell of the not, either at front or at rour. A prince-writter operated by one was heather and transporting and decaying to the traction driver from his seal without stopping—a long, continuous day-by-day ration, delivering at onet trin from 18 to 25 cultir feet of hard-this is the see be rendered by the marking Muscrated. For maning diet or send in and one struction, for rite subdivision work, for stringing road seins or ground pits, for extravation, for building exchangements, the low initial cost, low depreciation and low operating costs make this a wer attra five sensister and stare it is operated to the driver of the tracter this adds to the wite the cappilative wages of the extra

in the trade as "also reds," and the a militade of the industry may be jurged from the fact that in the year 1901 our natibe turned out a total of B.T.S.SR; bets of wire rock. This betail is greater than hat for attel rate, whose total carput new 2,002,516.
Of all the cartal products of largest judgets, why is one of the cartiest. There is establish that it was known to the curt Knowlane, and in the Kensington Museum, London, is a piece of wire which was made narrow, rather, is a prey or were which was that fact less than 500 years S. C. The earliest operand were mailing narrow errips of sprin metal on gold, silver

and copper, and ever very different from the mone wise that we know tester. The presidents of wire by wire that we know tester. The prediction of wire by dranting down a red to a consider discover, by pulling If through a steel do, be also an art with a veterable blesser, the first recent of its use occurring many it Ortelaulty both wire and vice male were to hand from wrought from and their end was high. It was only a question of than before stort, because of its was only a question of than action when, because it is low cost and great strength, because the standard non-terful in this we well as in the other branches of the nortal industry. Today, practically the whole of the

wire output is made from wither Dementer or open wire output in made this other passenge or open bearth sized, the latter being specified where high several respective are called for. As showing the strength of steel over loss where we meating 15 term to the accurr

of 40 time, and opentime to the eggar- inch. Of the special grades, n high-curben open-teart steri wite will purry about 50 tree, creditie trae, and the best cast or "plow" strel (2) tons to the acture itel: with our tata qualities of cost steel ulto, of a pasticular respective and celling for year claim

shown an ultimate breaking strength of 150 to 170 tons to the sensore incl The process of wire drawing series greatly to his prove the physical qualities, and the smuller the size to which the wire is drawn the greater is its relative boulding storage. We have all bound of the storage of plate wire, whose meetings maximum ranges from 225 periods for a single made wire 659 laws in er to 150 posside breaking strength for a singl wire ACC inch in discussers. Deduced to the enture-inch sirength would be from MC200 to of steel marks him will be of interest of section and phosphora on Line and make the sales of the collection they are flucture way from Thinks were not sense inch for when till inch in diameter to 350,000 pegade for nine total lack in discorder.

s the laget is the age material for little model to all nessets our story of the bills bearing furnises of the red mill It should be met statuted Insa Research billets and that spenderath billets are noticed up hits rule for the manufacture of clude, for special grades of for the manufacture of wire and for variety liabled products in which high conde strength is called for. Let us go to the upper They furness are bell continuous-healths farmers. These between use bell with a those healthed specurity in the describes of the wall and they are greated. The billet, which measure 4 by 4 below in section and 36 inches in 48 below in leventh one field transversely like the farmers also be aids, stal my pushed by hydraulic markins along Jan vertee world skids on that he the first they work

the upper end they have been heated to the proper

conjugation for mility. One by one other year our through the door and full tipes a conveyor tipes which they are carried down toto the not mill. The red salts in their modern forms are of two types, she the looping pall and the other the continuous mill in more works these two types are continued in one will. These mills empire of a series of pairs of rolls util. These mans empty or a series of years on your which are arranged wife by side in the longing util and petuliel to each other in the continuous selfore 13 pairs of mile in the lenging will which we have those the literation, and by the time the bilet has note the shift your (the last pass in the roughby tante the state pare there are been in the respect

of 4 locked by 4 larked by 48 locked to a cape-lack expanse in worker. In the femous half of our foll-page drawing we show workings of the first six pages tirregt there nils and of the Inished and offer the eighteenth pass. It will be noticed that the rolls are ground and that the opening between the upper and lower groover raries both in the contract and its comorthon one. At each pass the bills is reduced it area and proportionary incomes in length. Here, the speed of the successive polic is increased to comprisate for the increased singuistim. By clustering the shapes of the graces in the surcessive pairs of roll making them observably against and out, a dec-

energi working or municipalities of the metal is all tailed and its qualities are propertically improved After one stander 6 the anis pure through the

in the wire mill the first thing fone role is to thoroughly clean them of soul This is done by immercing the colle in w and is to morable them that it will be a first of the second of the seco

wire by hand, which dates back to seem (80) you flow the Christian erg. Wire-drawing not only sensite the prosuch mealer wire than credit be produced under the

> of drawing it from increases its tensile sireges to a truly to savigati in a truty isavigatie degree. 1 wine-drawing much romaints of a wellity con attracted beach on which is presented on a vertice to which the wire troughd as it is draw through the dis. T The Ge-plates are stone

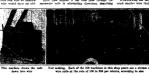
fully guard to the ex-The holes have consid

axis a strong curl-true druss, power drives, on to which the aire is speci, which are performed with looks care

werse, entering at the larger end. which is to be drawn is placed on a real, and the loose end having level pointed or sweeped down it is passed one moving now parameter weapon to we it as passes through the displaint and attached to the dram, while then proceeds to wind up the wire until the whole or has been drawn down. Since the wire-drawing is don roled, it can be well understood that, with a hundre or some of those moretises running at the same time is required for the providers running at the same time is required for the property and the same to drive the mill After drawing it is mercently to retain the six in the wire by periodic amounting, and it is though taken to the amounting room where it is loaded it large annealing pets. After a pet is filled it is care fully scaled to exclude the sir, and the wire is then

fully secule to evertise the six and the vite is the viscole to a sense, but the time step is to make been expected to a sense, but the time step is a required to a sense, but the time step is a sense to the properties goes to other allow to the scale to large properties goes to other allow to the scale to be aspect to the sense of the scale to the scale to the sense required goes to other allow to the row 20 to 400 squares resolute, such of which is expected of contact to a modern and write one of the first the scale to the viscolation of the scale of the scale to the scale work scale to the scale of the scale to the scale of the sca

equestry which has resulted from the detroduction of histon-earlier teachings. In a real upon, which the first of early marking is a real upon, which the real of directs with a placed. One and of the wite is led into the machine and as the power is theyern on one asset the with disappear through a small hole in a mentical continct; while in the occumpations of a neglet il casting: while to the accompanies of a reg-sion of blows that avaid like a machine of ann of finished with malls begin to pour out-posite side of the machine into man iron ben to receive them. The wire, as led from the or



long loom between each pair or shown in the ur

but of our full-page illustration. To make the rock late the proper rolls, workness round between each set, rol is the red bears free one of rolls it is select with a pair of lengt, best around through a balf sirely and fed to the next "pass." When a red will is running to full block, it provetor a most currient and extentions in rail heart, it pre-write a mase running and measurant vigit, for earling in its decrease in section and increase in leastly on the rail assess through the suppositor relia it is treveary that the speed of the relie be increased, and for the rine the red issues from its last or eigh th pass, it is transling at a speed of about 16 feet nor wingte, or lift miles on loan. Because of the musting length of the rods as they are relied down It become that elithough only furn or those made of a Il iggerte that attorneys only two or three reds at a line may be presing through the first of the role of the series, there will be three or four rode pushing structure-roundy through the later role, It will be understend that, also this variation from sero to onel and enal to squery is carried on, not passes of the legity will, the netal is subjected to an of medicalcal weights, and to

strength and general qualities are therein greatly for present, so that when the fixed round my 13,45th of prison, so hair winds the main regarding system or on lich in thursder bears fives the eighteenth page, as it is called it is already of high quality. As the rote leave the lost pair of rolls, they are run through pipe profes to cools, on which they are unual up late a convolvery cell for further handles. Fixes the real the who falls in to a conveyor and is carried to the wire till. The lasert above shows a cardinuous red still in which the beated billet pusses through a series of Milds the beauty many passes mirrors.

The best from the roll Resident, as in the core of the keeping milt, the familiar rolls are conveyed to ruels where they are colled into



The British Empire Exhibition-III The Palace of Engineering and Industry, and the Wembley Amusement Pari

By J. B. C. Kershow

and illustrated the extenses of the parti-ings and makers which contain the wan dees of Wessley and in their way are as remarkable as the exhibits which they erite in a process was more of the contrasts of the laces of Rhydrewing and Instactry, and then to deven for Rees to Wentley's Assessment Park, which is

In this sethic it is proposed to

of Registering in with the Power which is turked away in one conter of the Nection guvers spensy records a mechanical angineering, and consists of existing repreover 400 of the lending such neering and shiperinding from in Great Printing. It is the great grabitiers effert world with the hungage rements and possibili-

ties of the great key indus-Victors to Weether can see under one roof openother examples of both scithis section creatains the ing pinot, maritimery and materials that have ever been

smentied in any one building or exhibition. The orbible range from the most massive to the thest minute, and from the simplest to the most com-plex. Pirms where manner are household where show Utable preses and engines, while others exhibit delicate inactions and specialities known to engineers throughout The National Physical educational mond denometrating all the detail required th profess research, and displaying many of the derital insting and newspring machines used in that Victors can see every kind of remail and alloy in the raw and finished stone, and methods much to investigate currentlys and structure. All the present

investion, all the lained developments in this even-progressing engineering industry, many of which will be tasking their first appearance, are un view, and the layers and treining expert alike the section should prove of absorbing interest. An environce consent of electric energy in of events, needed for lighting the numerous great buildings, for driving the markinery, lifts, and for providing the heavy for the fratmost services and sententiates. This la supplied from the Power Steines in the Palace of descring level, and forces one of the new Interestthe exhibits. A steeled entires, enables the visiture to en the purkings at york, still in view of the fact that make of the leading linglish engineering firms have fitted their own specialities as part of this install constraints a relieving of exercical expension on

chinery and mountsthe Polest of Industry an attempt has been made to depart from the femiliarmen arising from the uncestricted Individualism which has characterized former British exhibitions, while applying the almost metals nego uniformity of Continental exhibitions on the two extremes los love strack by the adtion of coordinated schemes of devotation for traceledity all the ladustries represented while leaving sufficient rices for the expression of the individuality of the from taking part in the prevent deeping. Keek industry presents to the Watter is parties of the continue assessments setting for the display of its wares.

Chemicals, heavy and fire, with way, perfusery and pages, succious and the like, course, 40,000 square feet. acid and alkall, the inferior which have

arises out of the finification of each, the production of continue, and the propagation of the threshold and one products of the design and fine chemical industries, all products of the dynam and has described industrials, all the manifestions of these vital beauties of national Ris-ure Maximized. Considerable attention has been paid to the layout and in the determine of the Chemical Hall, which commiss along 150 years of a specialty painted fries. Musicating various operations in these The Retrick Center Industry to esetable one of the et of the world's textile groups, and an regu

the rates of its expert trade it ratio first away the transfer transfer of the United Kingdon. All the leading is interested in every branch of this indus custion) to regarder a comprehensive finality of maal, reschipery and products, and here spinning and sparring marbinery in marine also can be seen. Weel builder \$13 12,000 square feet of space, and Arty fran, representative of the spinning, wearing and dyeing menufacturers of the beader towns of Yorkshire

and one processes to which on all parts the temploy of the service against a final land. The Statistical land was recommended to the control of the service and the service an

In installed side by side with a ginat switchback. It is being from a not over a sale by the hieroscipica, and cover a sale by hieroscipica, deceased in lite citeses, end to much larger than anyth of the hieroscipica. The enabled "Devendants" in the name given to the vander chitten's playmount, where children can be left the charge of resident same with their parents explored property of the property of the charge of resident same while their parents explored part of the Embeddent. In this hields we would hand the "YOU Woman with their of the covers, wringing, not little parent with the side of encours, wringing, not her little guests with the all of seeners, swaigs implicates, sainlature ratheaps and a host of amounted derican dear to the hearts of childr An original Mountain Water-Chart, evertid as of \$50,000, forms another attraction of the Atten-Park, while the "Derty Bare" in some ways re-

worked, orders, slik stad other falcies, for which these

of Connerve has organised a conprehensive exhibit of the cont. Stortucting the main processes in the moin-date carry is show the inters styles of finded foreast and ways which have been useds that the products of the Bordford boars. These parties have been a great, success in structing struction to the Bordford exhibit. Notinglams, the boars of the Bridds have Bilgarry, has an extensive display, and this stand, company, approximately 2006 feet in the Palice of Deburg, forms fally to show the latest styles of fathhod dresses and

n) other as they ma circult of the occase A money of the earth 30 feet in discussion, with an in-terior large enough for visit-ces to easier and inspect it. has been built and forms annumeratic Park. On the side of this globe ships to seek in motion on the sin spaces, while in one is the crust of this minised interior

Cas ordinary mercy-go-round, but by a new mechanical de-vice the lacess, meeting in

7193 of 279 draw about or full betite

inhew Bods," "Arthing Mights Street. the Santon Serve.

shie the visitors to waith the fun even it
weather. There is also a charming Old







255

ing the barren aund wastes of New Zouland from encreaching upon good lare

Flax Barriers to Check Drifting Sand FEW talks south of the Rangitlan Rive, west count North Island, New Zealand, lies a wide tel of barres and wasts. Thousands of seres of epting dates and billionis over what mas at one to good the created land, and the metace of agi-ration of reasy thousand some serve is an imminent ager takes something can be done to may it. Two years ago a large parties of this area was taken over by the State Farrest Service, with a view to its

over up the State Parest Service, with a view is in-reclassified and final planting with valuable unifers. The work already accomplished aboves very definite progress, and overything puties to complete access. progress, and overything points to compare as a supplied by now practically a sandy desert will be inna-formed by splicially entire practice into a highly productive area yielding many thousands of fact of valuable timber, while the form lands innaedistrily adjusting the productive between the processing shaller and will be taske more productive by improved shelter and the cutting off of the strong said-layers winds from the

The work concessors where the orega beach frit the first like of sandhills, or the fore-date. This fore-date is composed of a series of hillacks of varying date it composed of a series of billacks of varying height, having little valleys between these, and it is through these valleys or specings that the sew-forms and rickles, or posses, according to sensible workfoldon, in an ordina stream. Hefore any permutant work could be observed in his contract these valleys or gateways had to be closed, so larriers were created composed of driftwood, bgs, etc., and instead about the light began driftwood logs, etc., and trainedularly the light began. The satisfactif displayed list need promotines as soon as it fels a check in his parts. In a fee days the battler was altest conjectively enhanced, and the small was pourfag in ever the top. A section better summetted the first, and the process was repeated while the little-vesting satisfy between the letter registry become bath. up. All along the line of defense, these wind-channels consisted to close up, with the result that one being

eabroken free-dune is being constructed to form a per token free-dine is being constructed in term a per ent, harrier against the engines sund-drift. Adam this first that of defence are connicen billions and dunes, all unstable, all moving allowing his survey and. These total he stopped in turn, carriered into clim as it were, before any young trees that may alread our burn to not a critical that plainer. The pacing at it was a cover any county constituted as the planted can hope to get a grip on their slopes. A close planting of narrans gross, that stry desires of the constal areas, is being used over the country.

Again the sand-frift which for yours has wandered

at the will of enery wind that bloom becomes are at the will of every whol that hiers because arresed, checked by the solitions of raths that his like thesely overed. The arresting amount will be reinforced by hardy shribs and busites; that in the sinterest loss of tisses will come conflict, intered to estimate weather conditions, providing the accounty station for the ner manust forest, which is due coome will come wante hand with worden grown. One of the most installing of these mand-arresting forces has been constructed of flux blades their constructed of the flux branch of the flux of this hunter is not vertically, while the other is method at an is set vertically, while the other is stretched at an angle of 60 degrees. The drifting sends not only beaks up against the front of this, but stilling through the spaces between the blodes of fice regular plots up in its lies as well. A special feature of the flax harrier

rices the ready! work "Two Star" Method of Position Find SIMPLE and very rapid method of finding lot A state that were repet towards of the attitudes of two state and knowledge of the time has been worked our by the James of Standards It is expected to prive expectably switch with circust. The method makes the of a diagram having introde and local address time for his conditates. On this and went more to the first to companies. On the diagrams are platted curves showing the relations of these conclusions of the angular attitudes of the two stars where the lections. They a curve marked 1940 diagrams will show the level oldered these and corre-spending latitudes at which Perelgram will have an

sitting of 30 degrees. The sittrades of the two states are measured with a cor arranges of the two state are necessive with a sectant, and on the diagram the point of which the proper owners nitions likes interest in found. This give the intitude at which the electrolists was trade and it also gives the local signred line. The intiglical-is they proportional to the difference between this local pe and the Greatwick eldered tiese The discrete can be used to any desired scale, thus a general diagram covering the whole United States of up even larger area diven to a stilly experient only a few degrees of latitude. North a strip could be samp on relies, and the just needed for an observation con-vegionly brought into view, By a suitable delice of

The Earth-Boring Machine ONE of the little job that has always cost more to Its neglitude would appear to warrant is the display of matrician and other escapations wi setter has been too small to permit

there has been a tentione, assured the nee of an markings deduced for this torness and this has been largely featured by the collector of an easty company whose bigainess involves a great deal of next or p Where the farmer with his from satisfied with the neckward are of the above in digging portation, the neckward are of the above in digging throughly of lades to be day a year out, and in st, have supething better The reaction Bluetoned is a modification of the is that it may be raised after sech submersion to our ur-absolutive track or tractor, and is put out to

the leading manufacturer of this vehicle. It digs hole the builting maintinefaster of this webbie. It dips holes from als larges up to four feet in dissector, and down to seven feet in depth. The digging these per hale maries from 1% to 10 minutes, according to the condithin and narray of the soil. The auction is in very fact an earth lever, it employs an outer as certifica-tual. The sizes offered as area's motion are 18, 12, 24, 20 and 45 larkes. After each "little" the same is maked and revolved quite rapidly, filted as off the diet by one trifugal flows. Otherwise it would just before poing far. The natellite, or our phenomen suggests, does not stop with the lacing of the look, but is also equipped for planting it. Thirty-few-foot prins can resily be set with the standard sould total as to the six-foot size. With the statement maked, force as to the six-root size. The so-called nine-feet number will set price up to Tr feet bink, having for this narrows a sweeks derried and ligher tener. The marking also patie old poles

The server See the eurile-tering muchine comes for the trust engine in memor of a take-off shaft at the near of the truncalesies. He frame is relatably apranged on a cura table, reality it provide to been below on either side and on the year of the truck obtains the necessity for difficult manuscripting of the orate into working position. The turn order operates g power, and will travel from one extreme posts of the other in 15 seconds. For boring anchor looks for cabbs, etc., the to

pay be tilted into one desered angular position, this bit of manipulation being performed by meets of a snear gran in restrict, the same worm is used to tilt the tower ferming toward the driver's nea



Boring bales in the earth just as a corporter bores them in wood

Seeing Without Eyes neverturer in his hunds and that he should try to 'see' and 'real' some, at least, of the langual letters. I made

ters 30 mm. In height,"

Littles 30 mm, in magni."

New, of course, the first thing to active is when the schipe obtains any aust of status of the object by treats of normal symbol. This is readered all the auer lespecative when we leave that spaque acress acri lopecation when we learn that coupus acrees placed in frott of the eligit perent the subject from swing it by means of "pumptic sight." Moreover, it was found that if the eligit were planed in the dark, it could not be "resoft by the galget; it must be We-intented, and the brighter that Hamiltonian, the more vasily was it mud. Until the subject have obtained a glisper of the object by any nacroal ments, despite his

The subject's eyes were carefully handsged, if is true; but it is next to impossible to hundage the eyes to such a way that seems fallet vision in not possible in serie a Way tract were many track to an personal deather. Could say of these subjects have obtained only degree of nectual vision by these same mental. It we accept Sensated Lenesty, we are excluded from this theory, became he utilated a considerable degree of theory, became he utilized a considerable degree of success in experiment upon himself; and, family, he had note success with military who had been trimbed in the war. There can plereduce be an essentiable death that seem such family as "pumpile signt" exists, and he a promise pershelpfushkafual phenomenus, requiring or a greater proper convenient presents required that practically styrine may attain since degree of success, by constant experientables upon blanch. Variety areas of the body seem to be instrumental.

from the subject, and in front of him. There seem to be two types of parcepts wisher; in a first, the subject field that he activative sees with it algebreature as the beals, in the usual manner; if M. Homenhar sale "bocompatric vision." In the second the schipes sees with his "solar pierus"; this is call "becommentate vision." The subjective experies.

with this letter type of One day the experiments . . Due day the experiments however must prise then when his head is raised he sees with these an object at a distance in front of him. Not chest an object at a distance in front of him. Noting in more astunishing to feel then this phenomenon, but noticing is more difficult to describe. . . The subject who sees with his chest has the impression that this athenries goes down in wore way from its usual per time—the head—to establish their, in a tirescop, tack vesion way, in the torse."

It was frond, by experience, that as some as the neural spire, appearance was stituciated to any way, this secondary riskins crosses. It is as though the so-vide secondary riskins crosses. It is as though the south primes to the several order of things as some as the engineer, appearancy is given. How can we account for this recursicable seep phenomenal Boundate believes that it represents a power will possessed by all township is a zoner or less inducted degree, which was originally inherent in all listing degree, which was originally inherent in all little hings. The most single organisms seem in possess a sent of diffused some or sight, all over their boths which become specialized, into the ryes and potent optic apparatus only assent the higher organisms. These organisms having assumed the special function of (Ossisherd on age 289)

ing but, at the same time, most complicated and differably provedble bearehes of chemand difficulty recombine beauties of clotte-letty. As its name implies, it deals with the chemotry of the processes in fixing organisms, their causes, noticely and results. For thousands of ears the exact nature and chemical connection of the various organic theore and recorded resisted a semi tagly imprognable moviery and nithough scientists positived in a gravital way that all life processes note exped or avarabled by lateled changes people of the interestion of the tienes and secreand of the organism, they believed that the unalysis of three precises, taking place within the organism and dependent upon the existence of the "life principle would please remain hope-offer and life's marginal The staty of the subject, however, use not suit abandoned, in spite of its needing inpelencess. The first inspectant discovery, which seemed to magnite the theory that the circulard processes directly connected with the life of the organies could take shore end within the living counties itself, was made by Spallan and it 1785. Through experiments in his laboratory special that albeing could be digreced outside of the living equation, by Iving Invests in centers within a give fact, with gratric juice taken from the attention of a busen being. are on a region sorry. pertent as this discovery was, it distinct dispet the f that the products of the living organism could belief that the products of the Bring organism could been be depletated by synthetic nechada in the ladorn-tory. The first step in proving the fallary of this be-lief was the discourse, let years upon by the demant obscule. Wester, that ures, one of the expertion prod-

enists bave succeeded in destructing he labors methods many other products of the atimal by vego That there is a used difference between the mot predering certain extensions in the litting consists and the portlants used in the elevated in dead cognition and the metricals need to the electron in corpo-cating the same substitutes in the information, is per-facile challent. Nearly all chemical repetions in the take place of a lenterature of special nutely 57 degrees Centigrade, and, with a few enguerie Jates, under an almost pratrat continue the gustric lates, under an of the juices of the organisms.

While alligners, for example, is digented in the human seguities it a comparatively abort time, at this over pendace the classic finds it necessary to built it als ours with strong hydrochletic acid to spill it up into singler continues in the cleaner where to up in to wager letin earlies disable and waive, he has to lend It in a cruefile to a high temperature, while the sains regarden obtains the same result at torqual body title pentur whilest difficulty.

to retaining possible this extra-retinal status

enrum without attentity.
It was though the shalp of feruntiation that whose nichell a cleaner understanding of likebooks) prorows. For many explories it was known that in the lewer of reads enable substants, which were called ferments, certain chemical changes in organic reason presents, coming consecut mages as separa-tention took place. Some foresters classed the fifty of grapes to wine, others transferred wine or buller fruit falces into vinceper, while still vision cursed bread near, present of the time of the control of the con For routy years it was believed that ferments with cellular structure were effective only if surhand in the constant structure were structure only if necessari in self, while engrous, like the guarket joint, could predom fromestacion even outside of the organism. Some of the greatest chemists of the labelswell, contrary, low-eres, like Bernelius, Librig and Emil Fischer, apparent ever, the Secucian, Lieldy and Rett Florier, apported a uniform still purely cleanful enterpten of the fireness, regardless of their expans, cleanater. They were than his helder that there is no actual difference in effectiveness between "forward" and "uniformati" for texture and that all Securitative reactions outsit and take place extends of the litting rett.

The trend for the convention of the formation of acts of the animal organism, world be obtained by purely whate methods in the information. Nines than the

take place satisfies of the bring rel.

The proof for the convertises of this theory was found transpervisely by limitates during this researches concerning the next complication processes and the resolute by which usang is split up than advantad carried contine will take place to the absence of little ferment cells, but considerably always. This lidd to the bold fits the ferments was never to confident the meaning output. agents which not so triggers in serting of certs getts which his as inggers in enting to common or restative rescribes.

Herett researches encouning the nature of firstens.

and the method of their artistry have established the troof that forments do not coming their activities to the reaking dram of encopilested hate stapler of unidentiate her that they are also conside of hi

COMMINISTRY IN Ferments and Their Work in the Organism Apple Complete Composition of Particular more ferments induce the suffi ting up of fluts into fut acids and giprorine, of build up fats from fat acids and appearing.
In one respect the ferments differ from the major In one respect the formatic differ from the suckery of other cutslying agoint. Each ferrient is specifically adapted to not an existingue in one particulary set of mentions only. Thus, as formati capable of agili-almanes will not affect combolydrates or fails. There are, as we low lows, many substitutes before, into the structural type of the sugars, per only three of them are affected by the fixing ferrance rolls. After or them are affected by the fixing ferrance rolls. Suchaer and his collaborators and successors had increased to extract from the living cells their ferments. sacrang to various from the fiving consister beyond-thoughouturing agents, it was found that the extracts also ufficied only the same three kinds of sugars. As the various kinds of sugars differ from each other

> ferments, that their active principles are equally dif-ferentiated by extremely delicate variations in molecular fucture. Onlie recently Bredig and other chemists in (with recently Bredig and other chemide have suc-ceeded by stirity cleavies), subtlook, its proteined maintyares which, like the formests, are specifically relapped to little only excita recording, as the result of some peculiarity of their molecular structure. In the option of many zoods molecule extensive the sense to proper the theory that furtherist are in fact enoughty against both up within the forment only as-mented hypothem. Solve the structure of the pro-ference of the property of the property of the Solvethearshift, the extensive research work in re-Solvethearshift, the extensive research work in re-

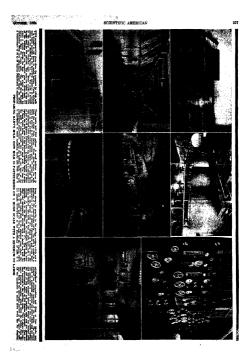
only by minute differences in melecular structure. It seemed legical to deduce from the specific action of the

second depths, Servitating the estimate research work in re-Servitanessing the estimates research work in re-botic bears better destinated and physical seature. We receptive the effected framess only by their sector, and more said clearly thus execution; we see the entire that the entire three sectors of the entire three sectors, the entire three sections of the entire three sectors are sent from the eight or organic certaining to bear. The extract from the eight or organic certaining them. The extract from the extract, usually by obtained or across. This process is extracted from and difficult became for organic thair certaining the protection's seaton only in section of the entire three sections of the entire three sections. gain untille are easily descriped by ex-lay the presence of certain chemical sal-called farmer; points. It uplies of these

who apparently possessed the faculty of secting rection and events at a distance, or objects pleased within closed learne, or of perceviting things which other men could not. In all agels cases, the accounts bear a striking re-evolutioner in sets and other. The subject second to see with sense organ other than the eye; the object were is usually exceedingly sieur, vivid, and highly colored. It is us though the seem, view, and tigray convers. It is not springs for subject were looking at it through the wrong end of a pair of opera glasses. At that superness, minimum, uncertainty: then the videa, develops, gradually of ddrain, and serings into their bessens. Such accounts have, in the past, falled to come our viction-parity on several of the insulely along attitude of the house start and partly because the

There avened to be abundant exhibites that mean meet foreity to this extend, but it remained for a aber of experiments which would serve to establish then bound all should and to offer a serious armires tise for at least some of these photometra. prestigation has intry been undertaken in France by Julie Branches (Lottle Fortgoode), who has just pub-"estre-estimal risket" or "parcettic eigh In only the this "pumpile series" to function, the earth) specials, and to sear releast the nemal conwicespres, read by abilities, streller water of expeducation being induced in its place actorstone being induced in its piece. This mounds like hypostica, but Remains' account of his work leaves little ground for such an explanation of his results.

After fewerthing how he repeatedly put his first experi-Down on ton' bundaged life eyes, and warmed him that he mould be using a family which he possessed beyond death; although he had never laid necession to discover it. I relation to him beliefly that I was enline to black a



A new type of imp-span suspension bridge, combining the principles of the candidever and the suspension bridge, which has been designed for creating the Gold Cafe, San Francisco. Longth of center span, 4000 feet; of hide spans, 1250 feet. Height of sized invests, 747 feet

Something New in Bridge Design Spanning the Famous Entrance to San Francisco Harbor

EX Solden State in the latter to Non Presi-cises Say Stress the Pacific Gress Str separates Non Francisco Secto Marin reporter our Francisco from Marin twenty and case off the city from the leveriful high-hards that beener on Neutri Description Transpole oxygentionally the fand red-there section afterest to San Francisco Mercoret, it he the home of the respiritual Sequela Grove known as Matt Woods, This region is now practically isolated to Helf Woods, This regain is now positionly secured from Sex Proxides, being resched only by a long and belies were note. A bridge at the Golden Gate would provide the direct expression and quick acres which are constill to its development

A bridge at the Golden Gate would serve the outlier presisting of Marin and Somes Counties to the moth in which are included the cities of Summille, Sall Baffel, Petalum, and Satte Bess. To the south the bridge weight serve Sun Francisco, Sun Maire, Suntin Clara and Santa Crus Counties, in solich are included Sur Francisco, Sur Haire, Religional City, Santa Resident and Saple Crus, with

their present population of 700,000 and a peak able fatere possibilitie of deable that number Preci of normal growth. The Cultivenia Highperiod to build the Bert the Berth end of the ledge with the ev being lighteneys, and improve the letter for the territory traffic the will lest The Con-

provide for two lines of trailer care: two I was, while all from part of the system leading directly into the Nagar Valley and dillander to the long Nariamento Valley. To the math the contribe of Sen Prantices and San Mater here in Securities a belot highway district, which will beind an artificated highway from Sun Prometers south to Beltwood ('By, coresing San Francisco Bay and lead his licensed to a transfer out removes any gave one.

By there to Alament Courts and the great Sen
Joseph Valley & bridge at the Golden Gate world,
therefore, he the connecting link of two great highway. exercises, reducing to the borth and south from Sam

60.0 feet. At 1845 feet from the shore, on ouch side, there are rock ledges covered by unit 30 feet of water. Between these two points the everyon doubt for 400 first in 200 feet; on community, no piece can be built.

We provide views of two proposed structures, de-We present stress of two prepared structures, de-clared by raw loading height engineers of the United Nation, Of the two views given, the upper ser- in the design of Mr. Joseph B. Bitmane, and the other was designed by 16t. Charles Dian Portion. The Straum height equivies of a 499-finet control upon and two short spaces of 1000 feet ands. Addingsh these are apprecidetect one lengths, they are travellation made pro-sible at a rememble cost, says the designer, by the type of construction adopted. Illitery learner bridge have been of two trues

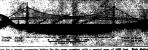
the cantilever and the suspension. The longest canti-lever span is found in the Queber bridge, which man were 1900 feet between plets. The interest excepted street bridges are found at New York, and spall coperation bridges are found at New York, and spail the East Elliert. Of these, the same underlie are the Hewklyn Fridge with IME-free span, the Williamsburg Bridge of 1680-50st span, and the Nazhartian Bridges which curries the discharding of being the heaviest

your of 4000 feet, which is the minimum the Golden Gate, he needs a suspension enthis length span of only 2500 feet. At the same time he riskus that open of only 200 feet, At the same that he rights that the proposed option will happer to the bright as in whole the advantages of the carriever in respect to willbeam and determinacy of streams. He states that this cartilleer asspension type involves only the well-known principles of evaluated design and thus in as definite and as certain as the two types from which it

are already stated, the piece of the bridge are founded in 30 five of major on two ledges of sock, and their construction presents as special difficulties. The ques-tion of anchorage at each end of the bridge is six-sisted by the feet that the challes can be carried them: pland by the first that the claims can be carried form and amoneted to the solid role detailing on either ship. Since the proposed index provides a minimum of 200 the claim of 200 the leaves the piers, all objection months of 200 the leaves the piers, all objection them a manifold ready between the piers, all objection when a manifold ready between the piers, all objection of 200 the leaves the piers, all objection of 200 the leaves the piece of 200 the piece of 200 the leaves the piece of 200 the pie

upon which are water ingood which are apper-ingood steel towers 747 feet to height. The maximum width of the plers at the base is \$15 feet and the depth of the cantilever arm of the pier is 550 feet. The

of the floor of the bridge is 80 feet. This new trolley care, two librard as, and two I-fret aldernike. relaterables in such direction, and two 1-me; soft-means, The eithering transes are 80 bet deep and the readers; is carried at the mid-beight of these transes, or 80 feet above the bettern character like at the beight. There is, thereties, but one doel. The flow of the bridge will flag approaches will b



ion bridge for the same o lest traffic of any of the great and

ed. He is at the sp er meet the esthetic

SCHOOL AMERICAN

sighing the Crashonae Off Pure the early days when we could get aghters gaseline, createnes dilution as yealers. But tokey the life of the scalable to seriously shortened and its calling seriously affected by the ar-chation of gaseline, water and sulfrare in the intricating oil. The caralog school life due to such citation of the motor like the to such district of the is a long one. Till now the only cro-s been in let it go on to the danger lat, and then to replace the cil. Ob-said, this is but a makeshift; hear how we creck the dapper of distric-ted we reach the dapper of distric-ted we reach the dapper of distric-ted we reach draft the encalcome, long fore we can arrived to drafts it, there is

before we can un'est so drain it, there is ensemb direction matter in the ull to affect learnestering matter in the ull to affect see progressive; and these effects are progressive; and encountering. The new way is to pass the consistence off through a little still, at a rate sufficiently angul to become that as appreciable discussed in the countering that are proceeded with the countering that the support of the same that has appreciable discussed in the countering that the support of the countering that the support of the countering that the countering that

in is ever present.
The terrain of the monifold drawn from the loss

of milk by using it for firing a red form, cake

with a meteor effect by the Department of Bleath of ringsprove of the patent all the off that opens up as bigh as that and all the gaseline that cores down as low as that. This mature is carried to a relat in the upper part of the receither, as the new out in called. Once in the releat, the advance of all and gas with a separate must by the Legaritate of greath to the City of Chicago, to teach the public the union of milk as a fiel, and therein to introde its consumption. Although Sherman McCollus, and others have dearly about the med in the typical Assertion diet of the nutritive elements to be found in selfs, merceplarly the cases. Once in the recent, the assistance of all and gas and water and other things is destilled by lead from the exhaunt. The lighter element—gaseline, under and exhibit composite—are tirred into gue and assex, and in that form returned through the manifold to the combustion chamber, where they are openmed. The various vibutables and adaptivis, the experiencies of selfit in Chings in less by wheat on-chird of a quart per regits than the conservation in the amongs American city. An educational computer was clearly needed under the direction of Mr. A. W. drying it out. The fuel had a R.Lu. of about 2000 units. This is less than the standard for becometive coal; but as the large barned much faster than the coal, the performance of the boller, as shown by the stress gage at the trial test. pairty changed the atribute of the railwar furi inspectors from skeptichen enthusians. The arisal ran covered about ton addres; the trada consisted of free and a heumother hadred by the flowk letend Ratirond, and about 200 provengers result gazarrend, and others 200 provestors were carried. The discussic effect aloned at by Dr Bandesen was fully section, done the subject govers, of extrust very sittractive to the newspapers shall be the "Morde More."

Building Barges of Steel Chan CTEEL vessels have been used star-ing meanly a century, but the idea of mak-ing lengths of standard story changed-

beheld together has extly New born po-into effect by Leute Henley, of Breen, N. Y. In 192 a lapper-invitory regal large having an error all length of 116 feet, a length of 22 feet and a model death of 16%, feet was repartanted. When finished, as light the time partity made of pide, a strip of divideb manicing invited level belief between each two rhespel-This large nitiated two tests which in a craft of th also are cults indicating of a remarkable rigidity was placed on two rati supports \$6 feet agent rati 1 during 24 learn, at the end of which no inciding or ranging was observable. Then alle was beliefed in



The characteristical barge which, with the exrly of standard channels bolted together

boat 15 per cent to the gamdine nillenge. A si thermostat solution the relature in the redict until the heat is authored to guarantee complete distillation: then a naive opens and permits the heavy oil to return to the condition. This process is reported over and to the conditions. This process is represent the con-over while the car is transful.

To the six quarts of oil in the crankness of a best oughts were safely a gallon of breaster and a quart of water. In half an lover they had been distribled out

and consumed, leaving the oil perfect. Oil has been put in the gassiles test, and when the gassiles has been all beent up. If has been frend that the device

has actually separated were of this oil (not all of it, of course, in the nature of things) out and de-pointed it in the crumbrass, which now had more off than at the start of the run.

Pechage the greatest advantage of the Pectifier is that one can fined the stages with oil without fruiing plugs or exceling. The owner of the our time restigned in solvined to ran old in his warry, in place

be of tills on a find free brought befo public by the continuousy methods, only thoughtful yet some in the consumity would have received and under eved IT; but which the Communicates of Hawilla distan-tions the determine that "wilk is to year leafy what real is to the Separative," Midweeved with present, and the way was pared for the very original re-metralist, stock process; The first med in the decomposition consisted of 120

unds of produced whole gells (chiefly neuros, dans pel stock, etc.), which was propured by make-pitz counter with makes mostless it has been been and

of eastern with rough gratifying results So servended not this test that the next large was constructed which of steel charmels belief depities at offermate of oil library by passin of children markets offermed without the interhensed etrine of sitts. Challe ing did not have to be done from the cuickle after haliding, as is the practice with wooden craft, for ing strips of home felt leaving a width equal to the of the flower of the charmels were inverted before the belts terr inwried. Three proced as tight when the belts note at up that there was no belong, despit

the absence of the restorate capitality This record issues as desperor for the la strength; and had an ownnil breith of 100 feet ell legen er 100 een. Filteenduck eksamels kan ing a weight of about \$4 promise per five were used in her construction. As these charmets any ill first welding had to he reserved to in order to join them and this was done with the sections

> The lowest channel is the side of the barges prewated a problem liver changely Sensing the bo tons? This was very people seized by curring the char nel, just as one would lend a card in the hand. The forme an advantable trums to the flot, becames bet-



a end, of the recti m by which the cranks



de se bemette at will.

ered investige to her result and farty-series should that they are useful and Wiene Investory are torrer one, but their tolent in nearly spread over the Scide, innerly, wearing appeared and departie contributors, although there see able exceptions. Here, instance, we have a directly of lovestion which is truly resorted in. We will not for the reader in superior any league. We that he below it is Not Beaten Lordon Heater, above it is on who comes originally from the Sensite although the is now parents; her activities in New

ors. Here is a list of a few of her inventions other than they filestrated: telephone rall life; handley with interdupgrable courts; helt cirber, ice comme fromer. perfl; sketzle for skirkl; rather reducing garment seinglish del; "Nidle Kiek" for beriege dee-

slove stars and a resistiv ter. Miss Henry does not dolor to have any special mecomfeal telest, but she succeeds admirable with II, and un tien turbilly explained in mesetimes as portal es it good denoting. In talking with Nior Stemy also temporaled the tites that investigat is the postpet of wittele. Nior titalies that is the worst way in the with the look for idea. Penties, she like life to explained, when size is having a guy time at disner parties or describe, or of the theater

The solution of the empty that fluides the occurof the tenkently to the frame came and day when I was preparing to go to a meliner with my matter," she could. That supper had worked me for a later item. The higgest underthis uses in the country said Of come, I did not believe then became a ten I start out to do a thing I mosaily manage to get it done more than. I was putting my gloves of when that spanner in all its details shoulded their against a green drapery. That raded the theater party. That ended the thent

come () just had to storte it set so paper before I should deput. Now I have these suppose painties, also the little stort placets that finder the seams to the I connect make up the mind whether it is a do beck or an advantage to be so unserly ignorant of merkenics as I um. I know melting about mechanical es and I con afrold I do make it rather difficult terns and I can affeld I to uses it, below concer-for the droughtenen to whom I explain any ideas, but in the fagnetic where I can known they are examinately patient with the because they seem to have a lot of faith in my invention. I have my invention potents enity investmented connection."

In still be interesting to take up a few of Miss Dentry's

go in sure or less detail. Her most famous investige is unfolitely her majority with classe ers, which are snapped on and off with the greatest one, insking it people for a look taxing on said or parsent to match the colors of any green. vertex has been very successful and their makes have laid a large sale. We Silvetner this assisted We Street, the private showing the seage oversign to several accounting the gride is "Lathe," which is a rather speak; adapted to previous usual in the literature, "This sizes amply entirely with the lost spike of way, which is an object to it in the lost spike of way, which is set objects to it in greatest diffi-



"Laths" the rabber speegs that takes the so

making the proper out in the roller and at led she was shiped to design at a broad!. She has made the rabber spongs in the shape of della, which probably robber sponge in the slope of dalls, which probably needs matter numerically in taking the come off Young Hopeful's bath. A map factors is two the map from ning out, while the latter nears though the poor the slade contributes fasts at all times. The spring-limb dell has also but given sorress. The body and limbs of the dell are made of neller-shade story and are than covered with colors or place and they are then made to be a place and area of "keepler" gad "belly burn." Speaking of delts, we also have "Miss lituries" which is shown in one of our engrav-

> Among the other levestion of Miss Heavy is an underlik dield which have the place of the allk put tow seed to in improvement in the leaf-ing part of the measury of the spherific Nov has also decised a Surrichiscol visibly one which numbe the peak brushfers in on extremely extract matter. Her hilt current hands of robber tobing their lactor or recent too ing their lactor org. Their is a man factorer at each real so that the ounter in charged arrested the latter and use of Serry's singure. which she is bried, is an fal-lower: "Filled with air cars the hair." The registre tree the balt. The negating pa-nes on intermediate to the co-min." They

> > spinger, but have little win down gut in the decide, and

tennellar the top call fire is. ings. Here Most Distry is performing a miracle by ringsing a brunette into a bland. This is done in an ineset by means of interchangealth wige and stupe

six different crains glass halfs will on the Indide as it in gyan. This different force are Justiced and any miss-less of vision quantization can be made with the va-of the numbers and the owner's bells. Miss Herry has also in varietied a religious index which is estudied to the Plates and appear and chance soluted to a first, how exalting the same to shave equily around to manuse at all thems. The "Nition Short" is an excellent device to brinch the citatives the time of day. By pressing a better the hands are rotated and in a little window in the clock will be seen a picture showing fairy characters, so that the child knows the shreing feiry damacies, so that the civil shows the when seem officed is turned to, he or she seen "Life". Bed Ricking Hood" and in a short time leaves to be time as well as a growtney. Miss Henry has hee in waterd a sheld for shorter than which can be firled it any shorteral fan and may be carried in the trank it any secretar may may may be the control in the construction of the construction of the construction of the construction of Miles Henry are a pencil with a heavy fitting ensert marking for contempting factoring may factoring and chetters and clothing and the robber reducing parsent which he is been to those who are bettered

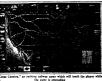
A LEAST CONTRACTOR OF THE PARTY OF THE PARTY

"test-apoint."

We have left one of the reset interesting investion in the lost. This is a game which we alrew in one of our pictures exited "Acress Country." The object of our pictures called "Acress Country." The super of this game is to teach the players how to trivial acres the United States from most to count by 24 of the Jestice militude, abouting others the countrylogs are trade, and the principal cities and towns presed an rotte. Capitals and Rute bounders these arising the banders. has not to hisrefers with the printeners of the railroad lines and station. The number of payers is fresh two to series. There are described tensibles. Series start from the principal ports along the Atlanti-Coast sear frees the principal ports along the Atlantic Const. and agent from the parts on the Printic Const. The may be span by such player to determine here using moses the travelers are to make. The external balls in the top conveyand to the colors of the invertees. The number appearing at the log principal the atmather of terms to travel through. Bufory stations the marked by a small strings, many statems for making by a small wide det, with heavy black, white and black circles around it. While crossing the country if A's man should reach a city already occupied by It's man, A's man takes the place of B's, which goes bedt to the beginning of the railroad like on which he is Either man may form his recovery six of

What is next surprising is the versatility of M Henry's mind. Nie seems to be able to invest along





Inventions New and Interesting

A Department Devoted to Pioneer Work in the Various Arts and to Patent News



A Vise for Hand and Bench WHERE small work cannot be held truly except by the old of the fingers this combination view is metal. The view is made up of two main parts. An envit citary is atterbed to the edge of the work beach or other memetral Report and a tapened decetall she be used the receiving the view proper. When used we a factor view the tool in set in firmly without acress or other meets findering. A partitional arrangement series to bild the Jane parallel of any special of opening willigh the renge of

For Grinding in Odd Locations A NXW portable grinding suchine for equipped with a radial arm which prove if excepted frequently stor is to erited at places oftend (terrosoftic The printing wheel is driven by a succe to a shaft which runs though the tabuto a set of stool level gents will frive the grinding wheel arter. The head arm and notice are carried on a two-sheeted hall-bearing trailey which rolls back and forth on a steel track and in kept to alto-coest by a rack and The long arm that carries the prinder is attacked to the teriloy at its exact is attached to the freiby at its exset-reacts of gravity, so that the motor values the princing head perfectly. Movemen, behas mounted below the con-ter of the freiby shaft, it creates he helands and helps the entire could in compilities when the weathers release like held. The heletyr of the france that



curries the trollier is, its its turn, mounts out the upper end of a transies when turns in the lase. In this way the arm with the grinding load can be turned the entire devanders around the law insking it a full radial grinder. The lead out he twisted or turned one arrend solding It possible to arini on ton, along either wide, or on the under side of a custing. It is in feet o

Dyes That Kill Disease HK old of the code during the year spek diverse berdres a per legent ment in a large littleh dye betwee works which will be devoted to this subject retindy. Its religation has shown that restall directally state of tales, specify decreased the harfill of a side range of diseases. One the war discovered for example, which at a streeth of one in Six thereadd the whosels of one in the Decision; of one of the anthray burilles; until to distribute a third to to (Sov provided mests of the Nedland Babilities for the first than when the attention of medical men wa-drawn to glassessine. This substance is

a powerful great filter and to derived from a policy dynamical and need in new and our sungery. See cleaning the skin to operation, and its other dim tion, peoply the very succeeded treat-



st of ringevens. A new educiese disin

invalued in a trief containing other has of European have last up suscription to investigate PARTHODY Sizes cream in his cof-Cream from the Milk Bottle e fee, but something the prolifers of supplying it appears on inexpensive one For the small finally, where a full jur investige in a ranger of the larger has pinsis of the out for further tests, while propunations are being ready by the inof create goes were before it can be need up, an excellent plan in to relative to of the milk bettle; and many hone-store here followed this scheme fo a oneptity have years. But it but always the essient thing in the world to rob. If the milk CHLIGHTANK is a frage.

fertiget is letter produced from the wore

is on head over tight, it can be per in a big pan in the evening and elitered is the covering; but when one has to deal with the meeting's bettle, this method in not artifable. The siphon limitated in new offered by a New York here to soler the problem of griting the cross of the top of the salk in the herie. The triescopic arm enables it to be "set" in the fiber between the errors and the salfa, or to any other desired point. If inserted in the bottle according to directions it is self-marking; and it steps suscitationally when the bottle

Invention and the Sick Bed IN reliablements with the physicians of Salt Lake Chr., John St. Con., who ninch leids patents on a reliquible a longitud had which to process a de-chied sucress ander preferables have in the local hospital. The estimation is hospital pends is said to extend fur beyeard may return bed more in two in with nonese. The main france of the bod is enterested of light-weight helicer toling the of the principal improvements over other made of headth being to the

doing away with springs. A plane of branty extrast paveling over a tubelet at one one firement he had of the put and toy be tightent or invested at util The custom has sufficient resilience by Adjustifer bred und fest are atturbed and selector designs which mile penaltic peris firm in my desire profiles are near of the application of the their less. Elevation of any port of the help, as is worrises desired in

is prochic in the new of the new led salt of a stroight pall on one last when the circumstations of the new reads safe involved necessary.

Another Section which less less regit into me singe the investion no factoritied by the newstern to of the carties

head ands taken it has become necessary

to admitister an amothern or give other

the device applet person the content that

center for the production of the leds of

Cellophane

THE LODGIANE Is a religious powder

a periodic transport, andstan etnew which cut be made in extremely thin sheet and is required in weapons catalos, Sad products, etc. All the order places that has hitherto been used to

this country has ever from France,

new amoraneouse has been easie that an American reasons has succeed in

deciding a power for auditor this ext-elected in America. The course outside

triting pery word pain and treating it first with countir sade, then with our beg district. The product this de taibed to met of steroet to completely

Physicisms and suspense who

It is planted to introduce the



while is wor and give an steelight impound edition alors is emparable to a mirror of redshifter. There respective or solidities very rapidly when leveraght tree contact with certain salts or arids, just us then the willie at on our when our late testing water can be used without distinction for the nesselectors of rither artificial silk or ordisplace in making ordisplace the terred through a slit-late sperture lab-it respektion but where it solidies into a solid transported mass. Full de-tails will be touse in theselect and Notellaryand Engagement

Cutching the Overleaded Truck METHOD a little different free Ste malereus platfors with its permanent installation, is now offered for the new of low-exponents simplicity, perioditity, now and quirk from of operation the area load mater inco- little to be desired. The ports belly is a posticularly valuable fortest the entire apparatus weight only forty pounds. A suspected track may there fore already be weighted where picked up. eladarities for recentrant which other felt when the suspected track is ferred to delter some distance to the neutral personners; scale. It increases nested to unity some divinity to the nested personnel wale. It increases the effectiveness of hard-decking creases or tirs on clang-thrit beatin a will adutus, the heather of a series cheens offenders, who can then deter-

became het first und the hest redicter from the core to the come surface Within two seconds after recoval from the heater the rivet shown beight yel-

low coint. Less henner bloms are the

Washing Delicate Fabrics

WE all know what become when

and hate things to a leastly. They are pull in power washers and are age to be returned closs—perhaps—but leading the harde-corned flags. Such trapelles

teny be availed by the tor of the little

waster which we Hipstrate. It is unde of paleszierd steel and is standed of the samide. It will be noticed that the

sides are corrupted like a machineral The master is filed with the articles.

This decise is of particular value

The Electric Cooker

desire condets in the variety oran

and there is nothing to break

The electric rivet-heater

around it. The drive-on had in always accumate, because each find vidual always accurate, because each inclinions auchine is tested in the inhumber of John Hamble Driversity. Its use elistiname the necessity for any physical on nates the necessity for all payment ex-ection other than the more placing of the instruments on the road excluse. In

A Flat Roof That Will Last FOR years there has been a design which would be weather tight, densite and restorical. To meet this densed and research. To neer this draund regiment of a Trempetent, this, our pairs set shear a serior of tree and ex-periment, with surfed blow and reinfples of construction, orapinaling names stant development of these aspertments and tests envired a rise which it is

steard, solves the problem. the flat roofs with slope of one-half in twelve littles. The slock is of lach in twelve larker orque steel with sliffening angles would rigidity. Eases, galvies, ridges and gat-tiers are reinforced. The flat, from sorface is ideal for the application of the ballium confer materials, which are on megord to the street with reading pitch.

The result is a pre-contentialitie read, designed for a 40-paged (for lead, but with the least total to 160 pentils without fallure It weight but 4% person rathers in weight for any possible a saving in the east of purities, risissed in the magnifurners that the red will lost Indefinitely. to the simplicity of constru ting of this steel deck roof, the underside promote a pleasing appropriate

showing a clean, smooth surface that is

easily pointed and forms an ideal re-

flector of light. The first that it is windstribed and factor-built in sails



relation between the steel deck

move to cost of production and passes this evaluary on in the outstaner. The large steel deck units and simple can nection make for speed of spection and a saving in later. Expansion and conat the Mate, which were every five, preventing cracking, sugging. ag or warning. The preding is belift up on the leb on went to the steel deck to In place and is reported with a positi head with to open laps or \$6000. In-validing qualities of the steel deck roof ser raid to be correctionally high, one uring to efficient helicitar heating

ofth promises of their Heating Rivets by Electricity SINCE 1912, in large Berwick many fecturer has been experimenting with and developing electric become for purpose of healing rivers of the man nork, such as bridges, military curs ofe. The operation of the heater shows on this team is over single. After the refler in the pizzt is connected the heater, the hapd extitch is placed in the negret, the tagst extint is passed in the eyest position, and he playing the fact on any one of the fact theadies the wer jaw of the netterpositing electrods is spend sufficiently to receive the tibet. This being inserted, the switch is closed and the rivet starts beeting. Additional the other electrades. A had rived in ob-

precipe on the size of the rivet. After

tions of which we run show only a few.
It consists of a het place which is the
"works" and is useful as any electric pending on the son of the titles, asser-tiating current of standard frequencies and voltages usual be used. A satisfy in

Named alactric residence earth of great all-arroand utility

orded for surring the softup at mer the time required the besting. The primary object of the new sleet brater is to reduce the excussive cost of builde rints; to langue working outdition in the secretary step, halfs of vessels, etc., by eliminating stroke, guest which are injurious to workers, and in these lest which is not only currently to the leaser key but also to the last he off and gas, and similar consented for oth coal and note beaters, to elle note the 32-estrate delay in firing up the mitair bernet and exided rivets Physicility is provided by playing the believe in river productly to the wed in load, thereby eliminating both loss of

the late, therets emistaring near the matter of there is proving rimes and waster of rimes. It is righted that it to 20 kiloout been will best a hundred pounds In fort-learning furners, the bestime tesing at the eater surface repetrating that ustil it muches the over conception and lancourse gain spressore appearinging a white heat lefter it is of sethelest heat to be sirter. An applieds of such a river will hen the starting of a delection the mond. But an electrically heated slow, it is stated, shows the review; the recreat, as near as can be necespower equally shough all perthen of the river, and as the aires

newis, and a new which is called the In the large bettle trip repriable-bolders zour he good to cook there regardables of others or a reaster par-tony be just hadde the lottle and the same cooked on a grid while the triplionte reproble contern are experimposed and the own counts all. Baking not le dute perfectly and with a certainty which only electric heat can produce Perhant the most retires eight in to a the bettle reserved, a grid just on by said the has plate received with legs and which in oir while the steek is del

chemit attick rovement in Printing from Copper Plates

Tilli art of regresting at repper plane
was invested toward the addition of
the lith century, but, although the art was groundy exhaused during the follow-ing two contactor, the crade method of relating from engraved or excised exper-plates pendened to the present thus. The taked plate with the apperluposed itspressure paper to passed under high pressure between two rolliers, one of which is turned by recein, while the other in turned by triction against the back of the plate. The high present back of the plate. The his becomeny to force the inge-table the Elman of the man crushes and distorts the pla-librates the fine fines of the



water, may or its substitutes. The cover is bunesed down on all sides and the reack is turned and in a few plantes or eithing even if the export has been hardened or comed with a harder motal. Becently a German inventor perfected the artiries run by taken our species. Recently a German inventor perfected at Improvement improvement of the authority of printing from engineered or enther report pitters. The plate is featered to the force down, after it has been properly instell, upon the improvement paper which rests upon an electic coulder filled with varies. The water inventors the core mentionly in exercitive racks builds THE electric store is regarded as all requesters leaving both to perchange The water propagates the pr and so operate. Not so, however, is the electric cooler which couplings a whole ware uniformly over all parts of the stone in assistance receptors and whose prime met in ion. The provint of this juste also for elastic material of the content misses is of rubber or of gather-content fidetic, process the paper into the fixed lines of the engraved or eithed plate. The inspecueious obtained by this method are said to be far superior in resettore and one delicary of the

A Better Watch Pocket OSK of the valuer but have the less of critical annoquates of civilized life has to do with retrying the than sheat with us. The reverse watch pecket is a pretty near place for the average watch. It is exposed to their or ordered dental loss; it rocks and means about his the coulde, he its certain utilizane harm: pet helesly apparently, has ever hed a thought for the possibility of inventing a better waith pocket. Now it has been done, however. In default of the possidans, however. In default of the possi-hility of potting a pintergraph shewing how is works, we present one shawing how perfectly normal and matural it issue after it has been installed in the usual place of a wards pocket. The pocket is said as a finished article, by power is said as a thinked arrive, by its number in the tellor, and the tellor pats it in in place of the cid-dushimed bug that has always done service as a weath pecket. Its superstance is please tag, and it safeguards the watch against all the hazards leading to its fees or its





The Precision Douching M. E QUALLY available for the personal use of the patient or for operation by the practitioner is the construction tractors need doubt and assistant personal tractors the practice of the production of the producti parates transmint several. In private ter, the futger of an excretive various is eliminated, and the partient to where a Gueche has been prescribed in its a posi-tion in fellow the instructions of the that he fellow the instructions of also apprecious to the letter as in the amount of section regulard. By westing the page, wit is evaluated from the bottle and how, which connect with any instru-ment in use. A short-off enables full con-trol of als or liquid directing through the hose. The gape shows varieties at all times. All figuid collects in the bettle, there. All figure collects in one own-which is really sterilland; and none can which is really sterilland; and none can

a clarged with difficulty Taking the Drudgery Out of Dish Washing

NONCOT leves group dishes and the thoughts of the distournising in come. An investor has lightened the hardens of the sink by devising a salter by which the scap can be passed with the water and the groupy dishes aprayed with map and water applied with pres-sery then deing away with the dish put A wire backet holds the plates in rand tion to be washed and a wire districted holder completes the cartie. The numbe in attached to the rather pipe which is wire would for a short distance so that It fersion is right openy pipe.

pet into the years or man, which would

Giving the Knees a Vacation THIS new water and politice taken the knew work out of politicing flows. You use it more or less no you do n can You use it more or less as you do a cur-pet exceper, public it bark and forth, first to war, then to polish. On one side are two felt warers, on the other two telebing brushes.

the Marinitiate shows the wants side of mechine on the floor. The wax pane is speed in the felt war-en, which are like a covered with small



ring. To polish, the magnitur is raised in handle and is entings over on the leasters. The short, stiff brisch-brasies, by senteof their lack and furth measures and friction thronts received, establish work the was late the smile of the word of five. The finishing touch is given by shaply placing small pieces of forms ongey pearing some passes of them-wer the two bristle largebea and operat ing markine. The whole process in turch the store as that which the best-inch

goes through to polish our's shore.

HE college of Expelsiv pistings production since the legislating of the sorbij war has censed great words; of tide previews metal and has made it as that the dwarfest, metallergical and other industries which require large quantities of platitude in the firm of cracibles, retern, evaporating diebes, tabes and other apparatus, were com-pelled to look for substitutes, obsepter and easier vicumelly, your if inderior in sene respects to nightimum. One of the most promising as

restly figure seems to be loss oxide. The oxide, which must be chemically users, is obtained by bigstay bighty over



priesed air though maltes from from which all importion, particularly malter and plaushouse and their exaposate hate revolucity less nearest. This pare site of the state ture out to metric at a tiggs intespect ture and care in maids. The roughly cast parts can easily be machined, an land and take a smooth fittigs. The coone and even lever than that ther substitutes. He received and quarts. The material is not attacked by aride or alkelles even at high trucares and in therefore suitable for

ur in the sugarfacture of mage sales and other organic or inargenic com-





tate percel per in the metallication and chemical industries in view of he cals-able qualities and of the fact that the A COMBINATION tool for driving platinus will probably results latered plugger on the deck and sides of probibition for musty prays to mean, per-

A New Use for Human Hair F. C HENGSBERG and control super Service at Baldissee, has invented a for more which depends for its operation on strands of lemma late. The inven-

on attanth of human halt. The invention is now in two.

The apparaties offsite of a brase case containing a hypersocyte value medication. Human halt, which has been traced to eliminate oil and a foreign matter, in attributed over two large and probled up to the protect tracks by an adjusting scene. About 400 to 500 to 100 turns combed panielle of the chart of the first hardward of the chart o differed that by an increase in the

matter and makes the pasts one

cke of the neter through a rela-The contact e-soral is not likelied to fog helis, but may be used for all types The fig value aris as an alternate to the sen value incorrect by XIIs thated Dules, who was the Nobel prize for his invention. The sen valve executes sto the principle that heat expands metals de deuter lighte electric belle er ger lights at might, and extinguishes them in the avening. In it four sectul rick uttergrand to the eggs bed. (the is outand with lengthiesh and removed with a rather. The again rare leaf this red which is connected to a make controlling the current or the flow of gan.—Abstract from Science, May 9, 1806.

n ship, thus percenting the peterution of water, takes the place of four sepa-tate pieces frametly employed in calking heats. By turning a set serve widel unit and making the proper adjustments for the two designed. Carlores are than carrying with them about the ship four different tools moreoury for doing such This combination of tests ples no tours space and weight no me The Physics of Speech and Hearing Hearing
HTMAN speech employs frequencies
from to to place time per second.

Four Calking Tools in One

out perceive round warrer maging in pre-cur amplitude from less than one-theneside of a director my cri.) to over 1000 dytes and in frequency of vi-leating from about 20 to shorp 20000 per second, a ramp of sixer on actives. used to netto-market are these situain the evated part of the area of and the The energy of week is carried to be for the formation in the same of the contraction in the contraction in the same of the contraction in the contraction insky it intelligible, tangely by fre quencies alson a thousant. Under quiet conditions and interdenting is nonsible with undistoried speed, having an latensity starsfore from our handred en granist, to a million times than that at exit from the result. estate fit. f. a. and 1 are hardest test corrects, the several for over half the anistakes made in interpretaand their high frequency overpri

to a meter which drives II Safety for the Spare Bulbs sintage of a 1980-rough) bug hell assumed similar of a 1990-people by hell assessed in a skehell tensor. Under the fail of auth a lover arm is suspended. There The corretor of rates boths for autoare outlight in the electrical desire, one uniter alliest a certain spages of dip being dry and the other motel. As the ger of icreshage. This tected box is spe bundly upper her in per cent if risity constructed to conside a nursien of both and hole three is such a number of that thry will be not about or be excepting a title which bends the disdereged by the constant vitentists of the cur. Steel springs and a locking decarner through a neing is soliched on to the tentur which operates the striker.

As not us the half dries of after the the build the talks securely and the man her of storing the builts in the box or Seg is littled, the mobil metion is broken



d carrier fee spa



r-blade carmer that combines an actomatic stropping feature

of placing in or reasoning the built from the large society. An automatic entries Better Piston-Pin Lapping

APPING offeither work in a new directs, the median theirated new ledge used in the lapidity of picture plus for automobile engines. The method consists in placing a number of the hedies spider, which is bented between two layeding where nearling on vertical stor. These where retain its opposite directions, and at slightly different speed. The fittalmaker shows the spider open the leaded prolitics, with wetter on the lower wivel. In breaky, state present, and the technical in wheel speed curpes the idea to restat inside path. The project that seek of the exhibit are not radial with the center of the whiles, and this comes the rotat between the ran wheels. Theres per of the souler rotates on an everytree The fact result of all this is to glob the lateing wheels, the revening can by variation in the wirelesseds, the stilling rotation rare-of by the suggester editor of the night and the laundons stilling of the work, and the manness stilling of the pin due to the eventric action of the spider. All this providea highly prileded finished surface, also



lately few from grouve. Betaltion is other reasons before the same limit, and the dispeter require accurate within a itself of play or selfers 1996. The two lapping wheels are on vertice are independently drives from a puller whell of the year of the markine. They are located in expensio locale megated on an extra leavy column. wheel or emilensity in this head, the other while vertically, adjusting its peelthe to the pin diameter which it is de-sired to ottale. Both are dressed inch-

Keening the Razor-Blade Strong PROVE John Holtman, of New York Pilter, the case who shares binned has now a news of lavering that cancernate be altage at the peak of modified which its age and degree of test for will termit. Mr. Foltmon's. ties comprises a conditution beider and singuity markite. The binds is stored strapping installe. The blade is stored, between starces, in strapping position. Then just before recentling it for use you give the leader a few turns, and the marking days the rest



stities of the new

The Road-Edge Light SPERENT is perpose from stay-ticing previously produced, the must eler light Maximirel meets at obvious need of today's needing conditions Mosted on the right-band mer Senior. it defines the car is interesting drivers. soking it obsolutely certain that your collabor is that of a sustage our, and out that of a standing car or of a med abelian disc. In sublition in illustrates character in addition it throughout the outer rise of the numbers for camp yards obsert. The long, straight shall of light trid short the shaller of the read, where you need it meet, is in parked outrest to the illustrated one of limited area in front of the cur obtalged for the gaver representation types d against test. And the number built before on the part of the our and the wide trace frees appropriately delivers. cives absolutely to place in their even Agretise very bendy function in the stables out of the real sixtenance report large to discount, or stook the race b find them, and yet don't have to numb-that the fight to the possible confining of seaso other paor of the read. Finally the loop out to detacked from the marries and then in lagrationly one created need of ware permitte it to regard feet of ware persons it to be taken to all purie of the cur, inside or out to links the way for inspection and

Water-Heating Boiler Serves as Fireplace A SHALL be easier beering belief on the ariet has the union freinge of exposing the fee to affect warrach and cheer

to collect into the room. At the same issier stel radiative. The frust part of the findes consider of a grating which The belief has other features which nocke it couldn't retreat The met is fed to the fire through a hopper which has a large expectly. As the coal born out a freek stopply is fed automatically by gravity. The gradual widoulag of by gravity. The gradual widesing of the cool and for chambers from top to letter merr uninterrupted percepts

The draft is admitted tour the top of the fire. This results to reflect our the firs. This results it perfect our-boating, it is claired. The hat game pare fruit the back side of the first to the water sections, where the beat is therefor. After the passes have rise: theoried. After the game have fine, to the top of the leider that are termed designed and push half may down the water wetlans before reaching the chin-ney sails. This hong travel of the la-pases in contact with the water tubes gives excellent beeting efficiency, it is

The latter is built so of sections after the fashion of sectional negletics, and may be increased in size by the addition of extra sections. Earth section curries its own grote bur, so that it is not necessary to down! the old grape when new tions are added. A revolution but water heating more

is made product by contenting properly distributed reduces to the new belief he amount compactness and next up pennater tooks a satisfit for use in the heliupowan if desired. It may be one arcted to any peol fire. Policelly the Japanese earthquake a othered in bettery formation to but at office building. The fact that the case completely assembled and long

named to be in stuck in nearly were tensor and then especially valuab for exercises use: but they are received to have done the large leading job to The Invisible Bed Wardrobe A WAY has at last from found where by a matriced must who has gradu-ally supposited away space after space in his chiff-nier to the greeting coll



reserve from enough in his belown to vice perhaps an exten dearn handler-rible and two colors. The invisible ribide and two column. The invanto wardwater allides under the bed, but 2 does not allide on the flowe. It rolls on rolls of angle-iron and the roller bear ings besie it once stil free make a easily that the feet may do the pulling One twellie fifteelity with such as ar rangement would be that the warrinds would run of the rollers and fall to the flore-det the one Hitsdrated is prorided with elider which extend seve inches to the near, making it possible is pull the warderde nearly day from under the hed without direking it. Even there

DERECT T MICE There retreming space several, or rather more authors, may be applied as any noted had, where the bracket rath which carry the best come in yarings which every the not come as you integrits and are further provided elements show to come year had happ to be a life off espatiant width, whole affeit is attached by comme



ten you carry stronged on the rack of

for order. In the full and suring occur shells when extra bedding is spt to be watted usually at about four A. M. Here is a assesty at accept four A. M. serve is a place to lowy anti-bedding, and levy it out of the way utili the weather in "set." Regularie and levelisations make use of these warderbes for occupants' use, while the same like your page up to be not a few solders in barriers during the late disturbance. Here, us in the home, the ent-ef-sight quality was the best

The Audible Low-Gus Alarm WEYE all had experience with the visible loss-passine variant. We are looking at accepting olse when it turns over into the denser position. Uni-

matriy we see it, however; whereupon we eliker seconds as to her long it too love that way and grow wrong, or else to overlook this possibility entirely rise we overlook this possibility entirely and innevently assume that there is a full gallen of gas in the tank. The re-sult is any to be discouracting. Full now weaks asserting different in the way of a foreign almus. It is attached to an ordinary dash-board gaps of the measuring type that shows Jack have many gallance results. And when the nd gree Green below a certain point float goes down below a certain politic an electric drival is closed that blows to begt sharply three three. Here's a signal that you can't excellent. More new, you get the security when the gas put down to three piloses; spalls at two pilotes; and at use polien the alreas naises a fluid appeal to you to stoke up with the fluid that makes the wheels an 'rogat.





The Instantaneous Calipers This calipe shows visually and in-transity the amount of stock still to be resoured or how much the work is and resource of the magnitude work in midwester at any stage of its reaking. In use the instrument is not to any desired materials with the hand on the "0" of the dial and the back stop is arrunged so that the work is emirally located on the omtact relate. He trying the work from time to time in the culture which has been set to a sample in this fashion the dial infinites the assemble of stock to be removed or the degred size. If the hand es below "I" too nesels metal han beer

naved. Abotive type of caliper of the same general uses has a head corrying the flat and switch a full circle about the plan-ger as the axis. The hyad reseales firm in any position that it may be placed in without the use of a clemping device. The cultiper is usually mounted on a stand where it is used frequently through

long period Stenciling with a Plane STENCILING bases, cortices, can bales, bugs and hunder for elegan to tenesty a rrowy 5th, and it is a store one. For John W. Inglesty, of Norfolk, Virginia, has invested a clever device called the planesarker which should make structling both a clean and rapid job. Recently, the investor states, he was able to stored accumulate and pigints was able to structly exceeding and plaining 500 empty greats marks and tally them in five astrones. The interesting device which makes this possible in called the "plantenester" because it looks like a plane—in fact, the handle appears to be a regular plane handle. This markles is fourteen lackers look, laif as wide. and weight less that ten pounds with the ink container changed. The meeting, it is claimed, will keep up with eight man hustling by cedinary old fashioned exciting by reality deviations of the driver on tally of the number of boxes or go by means of a country which shows the front half of the plane. This on the front haft of the plane. This has two residings, one a sect of "memoral" reading running up to six digits, the other a "thy" reading. This same that and make it numerously to exact the leads to keeping count, a great differ-ings with some employer.



ed it does the job in some two serveds. In our iffeetrati in the side has been re moved to show the internals, which con-sist of two draws or cylinders on which the stened winds and rewinds successicelly, a broad which spice registly, so lak container, half bearings, a feed exeil for the tak, and a chain dri The stored will take four liber of Tipes 4 type, three sporters, or two litter of larger. with the old, biget lakeet?

Comb and Brush in One HAVING the merits of both a comb its eletered to be better then either a both, this latest addition to miledy's talkt set has the further distinction of heing the only estering potent on hale consists, according to a recent search of the Patent Office records. The branking bristine unvisuals through help rating down the center of the hidden face of the teeth and extent equidatant on either side of each tooth are parallel, ile in the aune plane and point toward the adjoining treth. The spare between the briefles of one tools spare between the triation of the tooks und those of the two adjoining teeth in wreater for openhalf the length of the result first for the other helf, as is six the space between the teeth of a common type of the ordinary costs, i.e., une-half a fine comb and une-half courses. In per the slight pressure excited on the hair on it passes between the bristles receives with one or two atrakes all (too priarries with one or two atrakes all that and datafred and beings the actions elle to the surface thready insouring the much downed show with a fraction of the work required when using the old style cresh stati heads. By vistue of the same pressure the heistle-could, as it is called, has the facility of making bubbed



ed, has the facility of making builded to "stay par." When unlady-with the motorage window to effect the style hack-free-the-bounds-correction-are.

she has let to bristle-read it so, with

the awarence that it will stay that way for at least several boots. The letatio-

he single tool that serves the per pose of comb and of bresh

cosh is much reveal to be carried in a landing reely to reject the treatment when presents. It has been fund use able to lugart a decided curl or to the bair is certain fameable can but this france is still in the raper mental stages. The inventor also date that transfel heir is more easily and he sinfully arranged with a bristle-comb-tum with an ordinary comb.

Keeping the Oil Out of the Armature SECAPING of her a habit of getti

E into the constitutions and emission dags of electric motors and deing all serts of bad tidage, often abort-devaling them. But us Now Pitteburgh source ferturer has deviced a altereshmental which know the oil where it is wanted and eway from places in which it is not second. This weeklers has been attached

present attack is based on the bellef that if a perfect six seal can be kept up there cuttert be any leakage. If the air cut's get ha, the oil cut't get out.

A control return is passed on the state inside the bounding, where it forms a seal and not us an all thereor. This collar rate in a stationary piece having the enter angle, but with a soull risgrater between the two control auctions. It may all gets belon this clearance with the name is statistically to be held there by capillarity; and who the moter is working it is makkly drawn to the badde of the laceding by contributed force and thrown against the postering once. The war kind of arthur takes place on f table of the locates. At the outer radi of the housing are felt meshers win The top of the honeign is cored in order to balance out our differential



lendency toward varieties in negeral by entificated force the ansature because a set of centrifugal air persp. This sect of bearing in being used on system making 2000 reveloping per minute

Morphine from Adulterated Opium N the Journal of the Society of Chem-ical Industry tiers is described a prices of undufsciering as epites from products which are derived from the MEETE IS IN PROCESS AND SPECIAL TAKEN IN sea-through process. The ran material was continuously with topolate olds.

On solution in water an acid solution is alsoluted. It is important to see that the nater used in not alkalite. The first step in the process is to describe the mittings starest of water that is re-united to effect solution of the opens and the latter is extracted three than in succession with water in this runner. The extracts are confident and ented on a stress table. Both the haptentury at which the exprestration is reacted set and the degree of the con-necration must be controlled as as to give a newbort of the highest analysis The free acid in the extract nept be The river and as one con-testeralized and the invited sold resul-be eliminated. The pentralization is of be eliminated. The pentralisation is of feeted with the sid of reveletizated challe which opposes to give the lest restit of any of a number of avertalizing agents that were emphased for this ingresser The angulate is expected into the form of the invited by the soften of cultima chieride. The indirectionist is cretailized rat of the chair Bases rufe portible industrials is a tuted in the form of rakes by tree ment to a series press. It is then reunior and contribuent. Purther nor Souther has reserved to its order to remove the surcetite and other underload red



A Coupler That Always Co ENVENTED by James B. Thorn NVENTED by James B. Assesse, St. Louis, the latest rest-out-clature as a potton adventage the f

that if the excelers on two addrings cuts are out of line the bedy of one or both map be thrown to one side, by at both map be thrown to one side, by the adjusting hove, to take up the attential by which they full to need. The of justing from also nalow the look to an couple cars, or thoras the knowle oper for country. All this region it unteres the ours for condition over to go letter were killed or inkned in the fire trace endire 1930

When the Telephone Line Be-comes a Radio Antenna OHENE is nothing decidedly Tillize is nothing accounty about using the usual trivialence like as the antenna for the radio receiving set. The practice becomes has been to contact the radio receipts set

telephone lear by sensor of a small fixed consistence. In localities where exertined In vacuum which may be set up by the rapid revolving of the amestore. This provised aptions gives resultable rewith rom for long-distance Non-the tests treelds with this idea is that it is unlessful practice The take phase computies specifically state that their lines and their instruments are not to be procured with, and the reaction already referred to gate be externed as wire-tapping. None bright experimentar has discovered that the actual tapping

of the triesdate like may be treatly dir consisted by placing the trend total photo invircement on a pic plate or other tertallir olden which in restractive confiner for a series expectation with that he imended the special derivashown in the accommunity illustration which is betiding more than a metal pla on which the telephope instrument site.



instrum ent to be used as radio entened



Two French Radio Aces—Commandant Ress Houry (left) and General Ferrie

A Chat on Vacuum-Tube Unbraces as common as N OW that variant takes are almost as common as the electric light balk, it seems nother a late date A Chat on Vacuum-Tube Characteristics while most of no near know the general facts regarding our rurans tube, there are numerous fine points which we do not leave. And it is these the points which make the difference between comprismily good sales and just plain, medicare results. Hence a few

words at this time regarding the lower known points of the most counter types of varieties takes.

In this clast we are dealing with the radiction security takes, for the reason that these are most widely need. Furthermore, it should be remembered that the radiotens and the Cumbaphase tubes are laberted true for true. Thus the Cumbaphase 1-220 is the same to the radiotron UV-000, the C-000 to the same as the UV-301, the C-001-A to the same so the UV-201-A, the C-11 and C-12 are the same as the Wil-11 and Wil-12.

For the proper operation of vacuum tubes on debetter it is of unued imperiance that the varieties contactives and the values of the apparatus he as shown in the accumulating Fig. 1, and the accumulaing table, for which we are indeted to the Bullo Opporation of America. As shown in the flagrania, the grid return lend for radiotrons UT-150, UV-201-8, WINI and WINI conserts with the souther of the

Our Radio Page

Listening-In on the Latest Progress of the Broadcasting Art

the grid leak. For UV-200 the value is by to 2 magnitus, for Wil-11 and Wil-12 it is 2 to 8, and for UV-100 and for Wil-11 and Wil-12 to 2 to 3, and for Wil-16 and Wil-20-5, it is 2 to 5 measurement for the severage ran of edgalat, which 2 to 3 measurement power accession of edgalat, which 2 to 3 measurement power accession. When reddirects are used as proplete, small classors 20 the velocus of the edgalat as applied to their between the contract of the contract of the three between the contract of the contract of the degalation of the contract of the contract of the production of veloc and market, the grait at the time of the contract of the contract, the grait at the time should draw unty electron current. Should take occur, the plane current, during this interval, would be less be necessal. Naturally, such an action would result in he invents. Naturally, seek to notice would result in manifolds reproduction or dissection. In order a result such a condition, the geld start be materially as the second of the condition of the geld start be materially as the condition of the condition of the condition of the neutron lines in longitude (see notes 1, 2 and 3 in accompaning in the long contents as should be a shown in Fig. 2. Where greater values are assessary consisting the exceptacing diagrams and the sale of characteristics, the reals until sales in second of the very last consists declarable with malicians; par-

As for the specific purpose of the vectors types of rediction, we find that the UV-100 in the studies take at the regular market, measuring \$16, index high table at the repuse market, measuring any source may and I fach in districter, with a filterest consumption of .66 ampets. These standard day cells in series will operate the filterest. This rate is not only as en-ceptional detector and authority-group any lifet. Int optional decrear and antisofrequency amplifier, but it is an architect multi-frequency amplifier par well. As its refer tables, the public and his objects, in anomal, on the public valuage enalty-off. Deed as an establist, plate voltages up to 50 may be employed. If the curved grid bear, shown the table is possibled. It required clight pears of observat measure to drop the linears of the UT-100. The result for marked improvement over sold tatgoom flaments for the thertained finance of the UV-100 tole counties to high electronic endeded at low filtrands trage

a quirthese of operation and long life, ingether with regardness and uniformity of operation. It is recogn

or 60 chess for a six-wit at Many adjustments can be made to while the set is in operation, and it is that a protective resistance, consists 110-rolt trappion larry, be placed to

that is presentive reduction, consisting of 118-wit timplish harsy, be placed in one let place buttery, preferrably inneedisoraly next in ray benshale, its order to prevent blow-stor-density applying the place with present blow-stor-density applying the place with the pre-ceding to the present time of the pre-lation of the place of the pre-lation of the place of the pre-bourses heardenessed and the resistance entermostity, select in a valuable protective. The UV-90 tibe, so well as other tubes The UV-16° title, we well as other tubes uside thorstand finances, might well be explice "The tube nilse lives," because when operated at the high a pecture, the electronic excitors faile of and the because inspective. Should this occur, they believe should be disconnected and the Singant's for about 20° minutes, which will restore its to discount and the should be about 20° restore its to

irrespective of the trouble toroised, there is no bet detector tube than the UV-200. This is a notal

"self" or "gassy" take, as distinguished free the "bard" or high-vacuum takes. Where long distinces are to be or high-means tribes. Where long disjunces are to be centered, this table is blest. It calls for a grid con-denser of approximately 40025 microfared. The grid look transp. Next by 12 mechanism, departing on the particular tube used. The piete voltage is fairly critical, and mapse from 33 to 25 wite. Various new should be applied until the less remain are obages should be appoind after the best resigns are of tailoned. For this perpose 2 is here it was a "It" hottery with variable voltage teps. Voltages in screen of 25 or 30 min should not be applied to the piate of the UV-250. The Simusti voltage is freen 5 to L4 volta The UT-201-A is a new and improved high-vacus er "hard" tube suitable for detection, radio-frequen or mark the seminar or corrected, really-regions; and outle-of-repeary amplification. It outsides the thorized dissount the same as the UV-SW. It con-sume only obsequence singerto, as compared with one (Continued to page 200).

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The Heavens in October, 1924

New Ideas About the Atomic and Thermal State of the Stars

By Professor Henry Norris Russell, Ph.D.

a commontpance to may in this days to science in advancing registry of this ery now and then an illustration of this ddity course near supprising even the sert. An attending beneated in front in recent paper by Professor Rollington on the internal constitution and evolution of the res, in which-distinguished authority that he is-he ris, in which-distinguished subserty that he is—nows a guite perceptible same of his rewn nationalises and be proposed changes in a theory which he decides as "almost universally accepted"—but which is only too years old. The writer, who had something

softled all fasters assurement accepted being the page of the writer, who had searching to do with launching the previous theory, for preun ago, representes well that it was fruit regarded as highly resident in its early days. It does not take long for a purely actually doctrine to become enthoder. purely releasible describes to become orthodor.

A move question of the psychology of automomors, though, would hartly be worth our time here. The subject nature of Postesson Eddingstein new work decrease it better. You many years it has been realized cerves it better. For many years it has that a great mass of gas, each as a star, must grow better if it contracts—a simple calculation showing that the pressure in the interior increases faster than the detaily. For a star mude of ideal or "per-

foct" gas, this increase of temperature with shrinkage would have no limit; but for one composed of relinary gave it would slow up and fittilly recen, as the detaily approached the limiting value at which the stress of the gas were parked as closely tegether that little or its free sace remained between them; so that at us; the ster would be about the spale of arther contraction and would cool off irbiness. Density, and Temperature

The writer, ten or a down years upcommently called giants; had all the properties of stars of low density, which must be growing botter, while the "dwarts" (as faint as our out or fainter) were last what we might expect draw, cooling store to be. Professor Biddington has done scorit to confirm this theory, by loom mathemat-ical analysis, which has established direct and recurriedly simple relations between the properties of the stars and those of the very nivers of which they now over

the Important readification which was sentimed at the sourt. Dwarf store, like managedly relatively cost on the surface.

See that the second sec

papers develop a theory, level on these endeforable which represents the covered facts with resurbable Recently, however, he has expressed good planting some for believing that the sparity should not remain better. The mechanism of the specity is undendedly the sisosption of the radiction by moon, followed by received a (which, being as likely to send the radiation beckward as forward, greetly shows its not outward progress). If this absorption is due to some process in progress). It this american is one to some process in which the atom ante independently of others, as in the internal changes which produce absorption lines of the

Internal changes which produce absorption lines of the type found in the salest spectrum, a given massive of about about he just as effective absorbers, whether they are close together or which separated. But if the phosphing is quasted by such a process as the expansion of an electron from the sales, it custout take place and or in the sizes picks up to the electron, and things are tellicity different; for it a distance, where stones up; trams are close together, the chances for such a

At his eleken. Oxfore 20 NIGHT SKY- OCTOBER AND NOVEMBER

process of trebending are clouds assolutioned than in Both processes depletion contribute to the to be prefinging, we estine at Eddington's obtatheory, if the latter is the principal factor, at his never one. In the contracting can, on the latest view, the increasing sparity would make it so hard for heat to bek set that the surface would give cooks while center grew instart—if it more not for an indirect effect of the rights inner termerature, which makes the circ these more fusion and so distributes again the chance that on a steen will pick one up. For a star of given man, therefore the opinion is not very different or confine to the two theories. On the eight one the surfrom imagenium should shouly memor in the star outgrads, while the total light (or sare accuracy, the total best) given out by the star remoted intrinsted On the names theory the temperature rises a little ster, and the total heat increases, but very graduativ But when we constant two stars of different success the

The Heaven Territor from theory to set contentury survey of the But when we campair two stars of different spaces to two theries differ which. Taking them under rach conditions that the brianced temperatures on the same, we find that the star of small mass much be supply denset. There is thus no reconstruct effect to excitations:

theory, and the upshot is that the newer theory predicts much groupe differences of heightness between stars of large and small mass than free the sider.

How It All Works Out

Just here came the surprise. On the older theory the plant stars agreed very well. The dwarf stars (which are, on the meetage, less manable than the glands) were much faitner in comparison than this difference in man-demanded, and this was jud what night be expected about into remark, and therefore about as dense as any state could be. Her on the newer theory it was found that the difference of mass alone accounted for

ments and the distriction of passes mays accounted the providedly will the difference in brightness between the glants and the deserts, leaving nothing to be explained otherwise. The apparently intrinsible consequence is that if the theory is sound the atoms are not "immed must meet be track dener than the est, and may be dener than iron. This looks bad for the or theory; can we suppose that status of Samiliar elements can be of one size in the laborature, curiere we are sare that, in

wild rwise, they are practically in conterts still of a different and heart smaller in rently good, and not bed, for the theory, no Riddington potate out. In-die a star the inspersion test be measured in rall Under these condition build up atons as we know them would stateshiedly be kneeked loose nuising re-con, strings will receptle with an all minus of the same element le very much enabler, for salty these electrons nione orbits were close to the atomic harless would be strongly month attracted to people the clara effects of rollisions.

From investigations of X-rays the dism eters of such about resident cut he cut mated, and Eddington concludes that no inductor of their close micking would be perceptible uttil the mean density of the experienced gas because at least ten then soud times that of water. This condu gives extragger as it is, is burnlite constroyers and it cany well be that foldingten in right of star, and from that of stones, rocate to be made. One great advantage of the to be much. One great acceptance on use new theory is that it explains at last such a star as the exequation of Sirius, which is set; as the exception of Street, which is set; asarts former than the egn, nearly ne suresher, and, judging by its F-type speciests, a good deal hotter on the age flow. If it is an bright per square ratio as this lengthes, and if it is equally bright with mer. It would be only those times the of the curth and 20,000 rises as depos as water This last deduction has always been supposed

If Preferent Edditation shares that It be not, he will have done us all a service. not, he will have oute us all a service.

It size respect, at level, the evolution of opinion has been stead. On the theory hold before 1910, all stars north pirett. An our corney need telefor corn, an exbatter and over colder, on this have riral, all are greeing better, incide at least Thus might happen to a viar when it grew so dense int even the lettered revolve of the storm could be countried to closer together whether it would then begin to real steam, and what it would be like after it had grown cold—three are question which Prefessor Eddington has skedniese asked blanch, and which in

due time in may try to agent

skies, we find the great square of Peganiar clauset over-bend. Below it, in the southwest, are Aquerius and Confinence, with one bright object—the plotter Man-in the worth in Foundhast, in the Southern Plot, and still least, the conscillation of the Crops. The worth east, socupied by Cotax and Etidentes, in one of (Customed on page 230)



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Policy of Pure Water

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The R. S. Y. Co., Inc.

Ultra Violet Ray Water St



F a friend tells you be wears lead. don't think he is crasy. Every time be puts on his raincost and rubber wershoes he done some lead. When min beats upon his aboulders and puddles of water lie in wait for his fost, lead belps to keep him dry.

You may not be justified in remarking that people have "lead in their feet." But you can say that they have "lead on their feet." More than 10,000,000 pairs of rubber boots, \$5,000,000 pairs of rubber aboes and overshoes, and more than \$0,000,000 pairs of canvas shore with rubber soles are being made ansmally. In making rubber footwear and ing, the manufacturer uses from \$% to 15% of lead in some form.

The first raincoat a failure In the first waterproof clothing, made

about 1790, crude gum rubber alone was combined with the fabric. But under the supposer heat the rubber melted and fell apart. In cold weather it hardened and became as stiff as a board.

Curing the crude rubber Attempts to make this soft, sticky cum

stay firm and strong-to give it toughness, elasticity and resiliency-finally succeeded in 1830, because of the persistency of Charles Goodyear. Now you nan wear waterproof clothing even on the hothest and the coldest days. The curing process is known as vulcanization. The sulphur. At the same time other materials are added to improve further the quality of the rubber. Among them are lithurge, basic lead sulphate, and white-lead, all ee obtained from the metal, lead.

Lead is used in rubber to obtain a uniform cure and great toughness. Today more than 19,000,000 pounds of lead are used arously by the robber industry. and yet this tremendous quantity is or THE PERSON

a small percentage of the billion pounds: of lead used in various industries in a year. From water buckets to fire hose

Lead in rubber fre base below to restert your life and property from fire. The old backet brigade and the freman in his educiet amon more. The modern

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and boots and hard rabber below After a rule in an automobile, in whose norumatic time there is lead, you enter your hour to find there, too, robber artiries contaming lead. You walk on it in your rubber both met, went it in a rubber appea, and use it in rubber iar rings, and hot water bettles. Lead is in hard and soft rubber electric insulation, hard rubber courles and pipe stems.

Throughout the country lead in rub her belting is beloing to meed up industry. It is in conservors which carry millions of tons of cor. coal, grain, sugar and other articles through mines, mills and varybours.

Load's most general use NO matter to what extent lead is used by the rubber industry, its most nearly universal use is as paint. On every hand you see houses covered with white lead and metal structures protected from rust with red-lead.

Ask a professional painter what give the greatest profes-tion to surfaces such as wood. He will tell you pure white-lead mixed with pure inseed oil He has probably been using it for years for exterior pointing.

Property owners are today rutting down repair costs and protecting their investments by more corrful adherence to the watchword, "Save the surface and you save all." How do they do it!

By covering the surface thoroughly with white-lead pain Producers of lead products Dutch Box white-lead is the pager of the

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The latest and probably most complete story of lead and its many uses is "Lead, the Precious Metal," pubhabrd by the Century Co., New York. Price \$5.00. If you are unable to get it at your hookstore, write the

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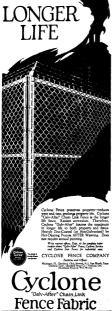
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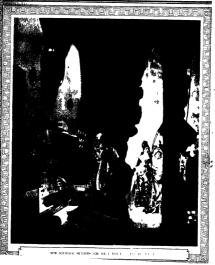
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Mr. Welker and Mr. Birel research.
Mr. Welker becoming Militer Emeritics, which means that he will be freed of ellerated doubt in order than the instruction of the provider our readers with the thoughtful and an-thoritative arrives for which he is used in the pro-well brown. Mr. Learniterm, size. will known. Mr. Leenstwan, also, will be associated with the magazine as one of our Corresponding Editors and will have charge of the Madie

page. The policies of the assessme rescale ORSON D. MUNN.

O'S the 28th of August, 1865, the first oditor of the Scientism Assignan printed, in the first lease of this suggestion, an intention which the more details tine, in intention which me morph color-does not believe that he can improved. "We have made arrangements," he wook, "to furnish the intelligent and liberal workingson, and those who despecial worlingsive, and those was de-light in the development of three beaution of Nature which consist in the laws of Mechagies, Chemistry and other branches of Natural Philosophy—with a paper that will instruct while it diverts or unusum will instruct while it diverts or unusum value when political and politary newspapers are thrown until and forgotton."
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I N that some first issue of the Sconrosto I AMERICAN Mr. Porter amounced what the magnitude was to contain. "Such non-versible threshed," he hadd, "with force two to five original regressions, many of then elegant, and illustrative of New Je-contions, Scientists Principles and Cartons sentions, Scientife Principles and Carloss Works; and will contain, In solitilise to the most interesting saws of pawing events, proceed notions of the progress Scientifes made of the progress movel; Scientifes Doncy (Inspirative of the principles of the sciences of Hechanics. Checkery and Architecture, metal infor-mation and Instruction in various Aris and Trainer; Carlous Philosophical Su-periments; Misvilanests Intelligence, user and Pretry."

Boost for the "neady and peers" that Recept for the "meant and peerly" that is what we offer still, and proubly the absence of the lynk acts is compensated by the fact that Mr. Peeter's "two in five original expravings, many of them elegata," are represented in the present mun-ber by well over a hundred segmentage, must of which are quite as "elegats," we hope, as any that were available in 1865

IN 1865 Producer Joseph Henry was in I the thick of these invested experiextending on the new can see, the first step toward the coursels of radio. In the present leave we print an account of some speciments almost equally remarkable, age of General Perris and M. Joseph experiments almost equally reconstable, those of General Perris and II. Journal, in Praise, is nearly exceptly title ratio waves so that the passage of the fine-sate screen the flace cross where of a bin-seque can actually be heard all over Europe-could be heard, if a space took the trouble, all over the world. Both in the greater accomplishment of the trouble all over the world. This is in present accomplishment and in its implications for the future, the releasest which our special Facilie control of the future specials. Mr. Detain, describes on page 20 probably one of the most significant which the Scientists Assumed has been presented to the probably one of the most significant which the Scientists Assumed has

N 1865 to one had heard of the theory of telephone. Physical science was still based on the

With the Editors

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on designes has attracted much attention 231 article in this laster to describes Just what he does, how he does it, and why it works.
If you have a friend who is deaf this that you current affects to soles. O'NE of our readers, Mr. 6 H. Taber 101

O of Pitteldings, has been good enough to point out an error which creek into the article on fixed quarts published in the July lesso. On page 10 we said of cheke they run "lester on the weather gris warmer shid the bolt (of the produkts) longer," "If course, this should have been exactly the other way around. The clock exactly the other way arrows any rum shower as the problems gets sugger the new obligation for Tabor. We are We will try sec to do it ugain. S this leads goes to press there is a

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Helping Deafness by Nerve Stimulation

A Description of Some of the Newest Discoveries of Medical Science About the Human Ear, Its
Deterioration and How it Sometimes Can Be Improved

By Paul V. Winslow, M.D. Embyr of the America Madical America's, Marica of the America's high Harli America's Madic of the New York State States Society, Nov. Soc.; Commission States States, Nov. Soc.; Commission States, Nov. Soc.; Commissi

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where the second of the second

The circumient of the two we have the capes of how construction from colors, such as the red of a supplicate with a fit per hold in to per sent. He capes will see that the per hold in the per sent that the supplication of the shader or submit to the low or "waterness cases." But a first way in this count, one has of the assessment from any of the design is enterly. This is the second for the first of the capes of the value of the capes of the

some in the, for those we when attempt we were attempt with the What Glow-boxer are, it really, is a lever system to magnify weited. The south stress coulting in from the enthreals on stress gazine the section and see it into vifraction, just as we're level of a less determined in the control of the stress parties of it into vifraction, just as we're level of a less determined in stress, it put as the fermille level of a busing well when the stress when when a string on it is probable. It is the real to the control we have a string to the probability of the stress of the other stress when the stress well less. The second level is stressed to the charge stead in the stress which is stressed.

by a more or less for the jutter, to this first bone. The third bone is attached to this second one and, at for farther end, to the part of the ear that is still beyond; the se-called "timer" ear that contain the actual organof leaving.
This inner ear we will describe presently, but for the moment let us forces our intention on the middle say

This times are we will describe presently, but for the moment let us freeze our attention on the insidile serand its chain of three siteal pones. These bones, I havsaid, are a lever system. The sound vibrations contra

The Machine with Which We Hou The ear dram, or outer displaying of the ear, is indicated at 1. 2 indicates the chain of three collected at 1. 2 indicates the class of three could be compared to a lever agreem and increases the interest point and increases the interest point of the second, Al. 2 is the second displayers or "victor" that consumelates second displayers or "victor" that consumelates second displayers or "victor" that consumelates of harders, consuming at the collected of harders, consuming at the collected of harders of the collected of the second second of the collected of the second second of the second of the

from the ear from cause the first bone to vibrate. This sets the second bone to vibrating, and it, in turn, starts off the third bone. The second vibrations pass, there-from, since the extire chain of bones in order to arrive, at the end, at the door of the inner ear.

The bosts are of such stape and are no connected that when this happens the second effections are in-creased in magnitude. The levers do it. If you never the above out of a lever through a short distance, the imag end of the lever will soove a long distance. The these levers of the three bears do this, three times in wice, for the other colors of the month R is supported in the means of the model.

It is supported the same as the action of a phone graph needle. This needle, running over the bottom of the ting grown in the record, negative a succession. of tory small methods or elimitions corresponding to the microscopi, dente in the month. The models is connected to a long sensed lever system. This leave system magnifes the citrations acquired in the needle from the record, so that when those vibrations have

reached the actual sound producing dispirages of the in the beginning Just as, in the middle our the three-losse chain of leaves tragelfer the villentions that come in through

the ear dram
The former our of all, the securited 'later ear.' begine with another them or receivings covered window. attached, Just so the first bosse to attached to the main our draw which secureties the middle and the external Inside the window to with a rate street both is at techni there is a result up it filled with a women funds

provided in this liquid is a very proparisable award colled up in the form of a soral like a mea abell. This is the factors of runs of total on maned by the as the fargons of the control of the great phononium who dis description in better of the great phononium who dis description of the last tend on the ten to which we have Along the heath of this things of total ore arranged some thousands of move there can be an excelled out response to the different wheeler hack filter cuttients to the best through the steel markers more. When these (Born vibrate the mouth not worst in produced

bases if you are to bear a world such it a complete happen of you are to host a sound say by it is assupply that the spaker work? I.e. Elset the said assess flying the throat of the speaker as wit the day the off and rated war remail set. Blot the saw set is reduced from the our canal. Note ther strike assessment the our degree and set it late vibropium. This vibration is roug men'arrive to the three leaves and passes along them.

being magnified the while. When it reaches the models draw or whilele has been east, the whole, it has team or whose his team, is set him elements. This cause is whenging of the watery liquid in the lease ser. The liquid dear-monates that electrical to the dampostraphic filters of the Ougan of Out! The proper cost of these filters blicked. A next possessay new to the healt. Yet

one on mode.

All this complicated sequence of scaless comes which a small fraction of a second. So for as our bould known, it occurs instantly. Tet overy single step of it must occur and must occur properly if your bearing in to be an delicate and as accretion as the ordinary.

is to be an definate and as normals as the ordinary bushness of the bushness assessmen. The cut see, now, how oney it is for manufally abouges take worth danks put offer. If the litter was been about the second field sets out, if the latter see that the second field sets out, if the latter see that the second field sets out, if the latter of the latt of the three bones tolks out of the lever system or if samething happens to this system so that search vices-tions will no longer peer slong it, in any one of these

Hearing Curve of a Normal Ear

Heating Curve of a Normal Ear-lieure stocking who is having, solid by a Bourt stocking Normal Lands and the state of the lands of the

nces yetr Jeering will either be dest circumstation year desiring will option to openings to be serviced impelient.

The remarkable fact, when one considers the delicary and incirculy of this hearing option, is not that some people are deaf. The real naturals is that approximately provided the production of the property of the production of the productio en hear at all, Let us form attacken on the time bones

Let us form attention on the time bodes. Regions that asserting happens so that the joints bottom the time-bodes are he longer facility. Tou see the latest table mostly. The advancey manifections of the seried wheating will not occur. It may ease happen that the shalls of bome because so diff and right that no small. vilications can pose through, were without magnification.

This is no the same affect on though you split makes solder or seeling was over the lever against of your placenaged. You would not expect, then, that the transfer of the second vilications from the needle point. to the displorages at the would end of the him would continue as perfect as it had been before. No more one you expect that there stark together boson in your our will carry the estad excessivity from the our draw the real hearing organ broke the la tiled work

New it becomes unfortunately that one of the re Now it appears universities that does of the beauti of a universital indection in the middle part of the ear or indeed, of any inspectanting inflammation or inf-table in this part of the ear, is just this effect of table in this part of the ear, is just that of them

THE PERSON ASSESSED. posts such it has it

repairtual describes.

To return now to our origin stimulating of the narra cond pauglion bein to care this at e three gracii bones! Suppose that some day you forget a pe and let then lie out in the worther during or rwo. They will rust The joint bet er droving a re

or two. They will root. The joint between the ires-bidies will probably be rathed alto a fact the deducers cannot be seed. What is you do?.

If you have the probably the probably the probably probably. The distribution was or the rate. The joint works more settly. White a little of this "secretar" of the joint sidels price, by a little of the "secretar" of the joint sidels price, by a little of joint may be shared. If not quite, on good on row.

In the one we not not this same thing in the sidel-inguisher boom. Of comme, we make a strately need to probably the probable of the probable of the probable boom. Of comme, we make a strately need to the same of the probable of the probable of the same fitting in another way. Thus, in Seria is few was a seconglish when we securish in two ray supplies

in the name.

The ner contains, besides the ear draw, the thboom, the window and all the rest of it, a nowher
tiny muscles. Some of these lamp the ner destructured to just the proper degree, they corresp
to the acress that the drawner has on his draw it. that you see him readjust from time to time w

that you see has reargate from time to more while of condumn is playing.

Others of the ear muscles have the duty of leegle the three here in four the proper places, of moistaining the proper transion and position of the window long, in lamont ext, and the like Berry one of these transic size at they are, has its nerve filer that goes or where, many of them to the uph

active there, many of them to the sphero-politistic gas-gine in the new.

Everyone knows that it admixtate a norm produce a mobile controlled of the mondes to which that nerve is attached. When the decire strikes your knee in the well-known "knee-jord" test, the first and lag fly up in exposes to such a material controlled or the lag

Just se, when we truch the gangliss in the nose and stimulate it, the signals that it seeds out. His the sig-nals when the platt shakes the telephone contral, pro-





to Hearing Curves that Show the Rife of the Nerve Stimulation Treatment degree to white the larger to for each of the tares to token being indicated both

dain, beine of them, restrictions of the mention is which the seven-ther writes are strated. Assess observe they come contractions of the sing student in the stockle set. This stakes the three bases, The abous ter several facelity or each other; submittes between them are lessessed; the savestitity and leven adding at the chain of bosoms may be more or less should be the chain of bosoms may be more or less

rescover.

There is another effect that is probably important
also. The naucies of the middle our are theraselves
important to its proper working. If these materias have
growing stiff from disease or fiably frees disease, the ear
will not work so well.

parts of the control of the control

netwood. If the improvement is due casting, if not entirely, if the improvement is due casting, if not entirely. If the improvement is not extend to the improvement in the improvement is not extend the accordance of the improvement is the if one.

The same was then the case.

The same is the interest to the improvement is not extended to the improvement in the improvement is not with interesting of explosional statems have been due with fine the same act of shaping the same lowers to the white it is not in the improvement in the improvement is not in the improvement in the improvement in the improvement is not in the improvement in



Where the Nerves that Cause the Ear

The new tracks and profits, all most engagement is size, my describe the wint. The phase-point peoples, which is six may taken, and phase-point peoples, which is attendand first, is shown at I is modifies that of any off-laws called the of peoples. The sphere-photoly peoples assumes with the size peoples of a sense with the size peoples of a sense with the size peoples of the people of the sphere-photological tracks and the sphere-photological control of the sphere-photological peoples at I is such a next message to the massless of the inter- ser and sense them. At I is the fifther rest and sense them, that is the fifther rest of the sphere-photological people and the photological people and the photological people and the photological people and the photological people and the people and the photological people and the photological people and the p

to the tooth, as shown.

The simplest explanation of these facts is that the movement of these seems whenking through the macides of the war secretions the parts of this markle-,

and depotents, in part or bard, to be breake of an antimization of the second of the second of a second materials in a delice way. It is contained present and points make the face which of an average. It is and points make the face which of an average. It is and a lamedad adjuste to the resource is evaluated as a lamedad adjuste to the resource is evaluated as lamedad adjuste to the resource is evaluated as the second of the second

perfect from the others to design you are with this to be used to

Note
Physicism interest in the troining delays of Dr. Flador's
unit way around the following pages of him:
"Register Bound State of Product Committee Desfronce,"
"Register the State of Product Committee Desfronce,"
"Register the Extract in Caterried Desfronc Typingh Physics
and of the Nation Committee of the Physicism Print." Plant

under his direction

seen as the ratio occupant to the form of the form of

New Radio Aids for Saving Ships it was it investigate in it distincts, but it a month trip is been agarentee the past of the same facility. In the laws of the study of the same facility of the same facility of the same of the same facility of the same facility of the same of the same facility of the same facility of the same of the same facility of the same facility of the same of the same facility of the same facility of the same of the same facility of the same facility

The transcriber store, here has been been been been been some or yet and has been been in openion. For example, in the case of the been been to openion for a transcriber of the construction of the construct



The first in the fines translite fines, as actually installed. At the right is a small model of the newest form of the transmitter, as it was bong exercise in the first in the finesh finesh finesh fineshing at first finesh

Our Psychic Investigation

Preliminary Committee Opinions on the "Margery" Case

By E. E. Free, Editor of the SCIENTIFIC AMERICAN

nes and to determine the distr the Scientistic Author an Award h m with regard to the mediumship of "I me details of this reintrated mediumship have be noted in countries improved the Sussman: And recognised in provious losses of the BAUNETEE AND dear. It is noget that others can be disclosed in in the mention, we present on this page the sit metter of four individual members of the Committe setting forth their slews concerning the case. If this number of the Committee, Dr. William Millows of Harrard University, his best absent from Boat has not participated in the some recent sources, or

a not participated in order cover sources, was sift not be reached in order to secure a formal state-ng for publication in this issue. The statements of the members of the Committee low. Except for that of the Chairman they are see in althoughtful color.

Statement by Dr. Prince August 29, 1924. I should have preferred to have more oppor-patible for attending strings in the "Mangary" see before tasking any sciencest. But realize has the valoritates publishey which the case has indergone may require that some report of pro-ses shall be given to your readers. I stift may what reas shall be given to year readers. I will any what he proper now to be said.

So much of an opinion as is possible to give at this time, and by my, he haved principally on a straight as which I was present, and partly upon reports of hitlans as which I was present, and perty upon reports of hitlans as which I was now of the incredibite controllers, in one a plant that it was impossible for the derivers to from any independent jodgment. The broat has of this were under a method of comments of the derivers to from any independent jodgment. The broat has of this were under a method of comments and the property of th rei to which the Psychic rould and did urge obje the best open purported laws of the abstraction though consenting to it in advance; the others re expressly approved by her circle. The first we expressly approved by the circle. The first representation of the circle of the circle of the state of the circle of the state of the circle of the circl

far the experiments have not scientifically at conclusively proved the exaction of experience Unter I much Pine

Statement by Dr. Carrington August 29, 1924. As the result of sures than forty sittings with forgery," I have seried at the definite conclusion

hat pravine experienceal (thirminal) chemistres a grant representation (payment) parameter specifily over at low sentors. Many of the ob-reed manifestations wight well have been per-ced franchedit—and possibly were as pro-reed. Hercentring these, however, there recalls negative of invisions what phenomena were proed and observed, under practically perfect one trot. I elte, us an example, the continued ringing of the bell of the "regiant apparatus," when beth the medium's fect sected across my knees, being held there by my one clow, both her hands were and mere up my one clow, both her hands were held firstly in rains, the same poiled out to their full extent; and her bond heared by her militing at the time, at my request. The centent apparatus was on the forc; tipotas of her claim would not have reached it (as I twint), and her shoes were on her feet, showing that they had not been renarrower, was rung interestitiently, at proposed. The manifestation was repeated over and over again.

I am continued that no snap judgment is of any
value in a case such as this; nor will preventing 'the phrasumen denometrate their non-existence

The present case is peculiarly difficult, for man resents; but I am countried that genuine ph bettern have compred here, and that a probung series of elitings, undertaken in an impartial spirit

Actor and an

with the placest becaperable our or wash it arose, any be briefly stand as follows:
It should be realized at the outset that say piption regarding the resility of the placements in the "Margery" case has nothing whatever to do with "epitim" or any other theory as to the stans of the placements. The subpulsations of the forms-

ablest built by Readini and used in several sittle can were as to the estates

styrical phonomera only, such phonomera as the sevenent of objects, the change in temperature The first first control of the contr todings, etc., etc.

I have expensively been recessed to the arms this supposed incubation period.

I believe that in a field of inves has naturally awahened to morth simplicism employees to avail the dignity of actual post-most be very definite and often repeated. I have

must be very definite and offen repeated. I have not yet seen in contenction with this case such suc-feriority definite and other-topout photometes in the light: but I have seen council in the light to awakes a lively interest on my part, and I think the investigation about the continued. My continuous about the continued. My continuous therefore he than eight proof has the yet been formatised but that the case at greatest

oricluu

mal phonomena to the satisfaction of the me. We stand ready to pay those same of Committee instructs us to do so. We are t Committee of the control of the cont

Other Kinds of Space By Nicholas P. Rashevsky

Lecturer at New York University; formarby of the Russian University at Kief and of the Department for Russian Statests at the University and Polycocholeum at Prague.

IE is probably to living person, in litter-occupation at least, who has not beard and Singuishin's famous theory of refa-ity and gravitation. But, on the other presents who werk an element-polar exposition of this fa-sed to find some of the most

The control of the co

soc. And the markey of the senth fails so be fully attitudered in that it gives as a month picture of the way in which the "current space" of the unbream-chinesty no confinery three-fluoresism contrasses—may ready exist and may affect to and the world. This action is designed to provide jost most a pic-ture; a defails, concests, picturial lifes of what these remarkable are required or which the confinered in the confinered to the confiner

pay. We all remember from our days in elementary school of to mount by monnetry. It is that branch of We all resember from our days in elementary school what is seemed by property. In it that branch of maintenance which defined health is studying the reli-tions between the shapes of things. We represent these shapes by what we call figures. Seeme of these figures are on paners, as the extension lines, triangles, espanes, and so on, drawn on paper. Other figures are threa-dings of the colors or paper.

distancial, the color or sphere, or "shiften sphere." In the color like the sent, is the but by lake powerty of solid like the sent, is the but by lake powerty of solid like spectry, or but the sent of the color like the sent of the color like the sent of the color like the c

An emisgree relation below in well greatery the source of the diagram, C.F., of the rectangular to-milliples and the property of the source in the source of the moures of the three sides, AR, BC and AA'. Familiar propositions like this lie at the root of all our geometrical thinking. Everyone accepts them. Any esa neity then at will, for example by taking a rater and actually measuring figures like those on this

print. The geometry within we study in the elementary schools is confined in the noise to the geometry of straight libers and planes. The only cores studied is collectedly like clock; the only cores studied is collectedly like clock; the only correct sertices in the spiness. This is the presently included by the greatery between the present property of the liberary of the liberary of the liberary of the liberary of the library of the lib

to our study. Ther a sheet of paper and draw on it a place tri-angle, the that of Figure 4. Then bend the sheet of paper, as in Figure 3. Obviously the dissentations of the triangle are unchanged. The length of the line All

The Real Nature of the Woold Are the things around us real or are they thinkens? Philosophers disagree. They solve that we council be earn. What we see as reals

and trees and kenses and aminois may be morely imperfect reflections of some ultimate reality repersion represents of non-security that men do not persons.

Con seimos seine this mystery of what whitmats reality is that? We believe on. The Everies Theory of Relativity aroms to be pointing the way. In the brilliant series of articles of which this is the first, Dr. Rusbereity will tell how and why this is so. This orticle describes the nature of space. Next sureth Dr. Rushe unil turn to the nature of time.

of the paper has made the line now a curred line to stead of a straight one. stead of a structure one.

- Accordingly the bending will not alter the theoretical
of pinthe governity as applied to the triangle. The some
of its marker still equals 180 degrees; the sum of the
squares of the two sides (12 its a right integrals) will
optain the agency of the hypotensian. In general, the try of a curved explore projuged by applicated bending of a sheet of paper remains the same as the geometry of a plane. Such a surface will be, in probesiliar, of a sheet of paper resultan the same as the generity of a plane. Such a sertime will be in pre-real, either a part of a cylinder or a part of a con-straint by busiliar as some every kind of con-straint by busiliar as sheet of paper into the proper slaps. Piques demonstrates, the example, that it is impossible in spread field above of paper amountly over the sortine of a sphere.

If will be otherwise, knowner, if instead of the about of paper we take a since of railor. The rather will street. With nullsiant patience we can aprove the rather quite assettly over the others of Figure 6. The reason is that the raider has been distanted; some puris-







Dr. Nicholas P. Rasbersky runned to different degree to different parts of the

abber abset. If we key out this sheet of rabber on a flat surfa If we hay our this short of relative as a flat surface and flow on it the flowest of plate powerly—chimples, and flowest in the flowest of plate powerly—chimples, and flowest in the relative strength in relative strength in relative strength in relative strength in the flowest ship. The flowest in the relative is the strength of the

ments one acclusing of the agency that were out. Thus we shall simple and conclusive existence of a fundamental idea to present; the idea that the present; of the surface of a piece. Even the sounder of a piece. Even the simple raise should straight these will not haid for the surface of a sphere. It is increasible to draw a straight the other as traight the other as the other traight the other as the other traight the other It is impossible to draw a straight line on the sort of a giver at all. C o sporer at oil.

There are, 2: is true, certain lines on a sphere wi have some of the properties of a straight libe. For example, there are the "great cirries," the Bass which

resculie straight libes in being the shortest distanbetween two points. These great circles are Blustrate by Figure 7. Out of three of these great circle lin we may construct a spherical triangle, as is illustrated by ARC on Figure T. These will have seen of the prop-erties of plage triangles but not all of them. For exuple, the sam of all the argies will not equa-All this is expressed by earing that the rules of erdinary plane preservy to not apply to figures from an the nurface of a splace. Or, in the pure systematry

statement. "The greaterty of a spherical surface is see-Sa-Saras" It does not obey the theorems laid ion by Earlie Three raises, in fact, an infaste possber of cars surfaces analogous to the surface of a sphere. One of them is the author of an egg, another is the surface them to the nutries of an egg, abother is the sortice of an onlin or of a reasond discipline, will another is the earlier of a poor. For each of these the theorems of geometry modification. The relations between the ngles, rectangles or other figures will but be the o

depending upon the exact shapes and properties of the nees that agrice the early states and be We arrive, then, at a very important and far-reach-ing reactesion. It is this. There exists an infinite mander of possible curved surfaces and, so far as concerts the relation of figures like triangles and the like, certa the relations or against the triangles over the man, there must exist, therefore, an infetite number of pos-cisio nea-Euclifean presentries; all different but all troe, each one for the particular curred surface to

This belies of not-Karlidean grountries, each de-This infine of an Scaliforn presenting each de-pending uses the surface to which it is satired, was exceeded by N. Z. Laburborsky, R. Beitrann and other funnes presence to the redditectable space. They imagined provide promotion where the relations to-tured future in space might be different in the differ-tance future in space might be different in the different geometries, just as are the relations between the two-dimensional surface figures inscribed on different ed surfaces tibe eggs and pears and sphere-At first eight it may seem to one that this is a page









But when we try to apply it to other

peculation having no concrete and pirturable flut this is not true. It is just as preside at its operatif the valuence of a non-Eas lidean greened to opened the virion of the new term for a set it is provide to represent (as we have just) the existence of a non-Royaldem earlier. The difficulty less in the correct understanding of what 700

The principles of place groundry as no study them school are deduced from a set of simple obvious pe that we call unless. But we can write them es, if we like just us we can verify the relation wen the alides and the hypotenue of a right angle are nameds by an averting them with a ruler. We do this, that is within the limit of accuracy of raise. If the figures come out not golde right we at the mar was a little insecurate or that we en that the mar was a near measurement come or less

to have agreed that is that in now of any disancy between the results of actual measurements the lagical principles of Ruillis generate we will my that the groundry in right and that the designment's are wrong-or as we more connectily that the measurements are inaccurate This is a very important point and one that it be estial to group clearly and definitely. He general If a surveyor measures the three sides of a field that he shaped like a right angled intentio and if he bout the squares of the sides and the square of the spotester, he does not conclude that securities has not wrong with geometry. On the custoury he as

that wend him how were writer him blu recovered These reconstructed depend in the last analysis of the chains or inpresent rules that he uses to measure with that is on his measuring reds. These may be imperfect. But what then is a perfect measuring red? Nine we have agreed that if the measurements do not agree with the Fuelidean presents it is the measurements and not the permetry that must be wrong there exists spile clash sets only no possible definition of a perfect monosting rod it to one that

If we sendered by excluded into a region of the re-is quite the mater was an when a rabber plate which is I actident is been around a spine that is not Beddean-then we would never him a that or that our more now rode had got back on u-And it is quite provide that we are in sents a post of the universe to to lit is periodice count that in entra part of the universe, in memorrha, rods will get putrepresent to the temperatures of the hacildoor

the the I is lideen greenelty

le perfedit in c ∈ rithet cod spoce—the spo that retetrates this a tool tancens of ourselfs bot quite the same as the sq. is not be Facilit assumed. To retern to the lifes. I the collect short spotthed One of the subset that I are the state of the subset of th the reditory there are I are units in ners +lighth distorted just me the rubbet wheel would be if it were hid down excelliby in the souther of a spiner. If seen ego nadius and very small but will perceptible our for cureter

To see how this salght in proof it with ut its being apparent 1) our schoes of h. Dilinis manufacturings bet us consider an enemple formation by the areas Propol transcentistion M. Herri Peter of Let us insuffer, seld Potencied a facility or weste in-

closed badde a sphere of finished radius. Let us b this distribute world to have the delicering prop The temperature of the country of the world-uphe a definite value, say 0 degrees Orntigrade pensium derreases cutilizatly from the center of the sphere to its periphery, as that at the outer boundary of the sphere the temperature is the seculized absolute zero of 201 degrees below soo. Contiguede Now let us assume that all the bodies in this ficti-Now let us somme that all the balls in this factions world support and entertrate the requires to temperature and the set all the extently the mass way. But those all contract by 1/2500 of their dimensions at most Vantignale videouver their bengembers in believed by the depice. But of the came of the updown all balles will have their maximum dimensions and at the policy of the

riphers of the sphere all holles will sainful to positis and have by (formations' at all And finely as an utilizate stay of fination jet a sense that the world is shaulded by thinking creatures subject to this same law of materiactic and extense with the temperature. If such an inhabitant moves from the center of the ward present its peripherature for the country of the ward present the peripherature.

in he will decrease in size. Not he will not have that in is decreasing in size. Why not! Somese every ledy of windowner better that he carries with him or the eterosters as his justing at I is decreasing in an with the same ratio.

The stars of all hodies will depend so their distance from the center of the world. This being as, no one could ever know that any of the bedies altered in also

But response that an inhabitant of this first world discovered in more was that his measures number on a larger scale disagned with the rules of the Euclidean grounds: Would be say then that the stars of things differed with their position in squeet is would not the would possess no definition of also late size in which to determine the size of his obj

et different sinces

the system. A cypical market with a places of the varies from the Euclidean model. The place of the straight line in the place is here filed by the peed cordes, of which three are shown, and just as three ties, of which there are shown, and us to a piece form a triangle, so do th

ry was at fault. He would no the properties of his particular world—the properties that is of the "space" which his particular world com-prised—more not the properties of Equidden space priord—were not the properties or management. He would construct for his real spoot, or for the spot which seemed to him the closest to reality for his par-ticular world, a new and non Buckidson prometry on tally designed for that particular space.
This particular non-Euclidean world is

This porticular non-floridates wired insugated by Philosoph has a property that is of equal historica to the present inquiry. It would asses to its habitation is in initiated. At inhabitation rowing away from the count marker and studies in the limit of the count marker and studies. But stops would great out any other than the count of the world he would strike to a point, which would not be the count of the count of

would never reach, the periphery of this would hisself it would seen that he was advancing size into an untrely unlimited instating. This example illustrates a variety of possible likelideax square which would seen (to the ligh-ments to be infinite, attempt actually enclosed will a faither sphere. They would be 'infinite but likeli The next example, one constitutily used by I Shoutch, illustrates another kind of positi Einstein, illustrates another hind of possible Bordiera space one that seems to be thisbline the finite, athough really it is unfinited. We will consider, first, a two-discontinual lift-tion one concerned with surfaces and with crea-tion the construction.

that two on surfaces.

Emegine a great place sphere, resting on an infailtr
place and with a source of light, at the top of the
sphere all on Historated in Figure 8. Insugine the ext sphere all as illustrated in Figure 8. Imagine the sur-face of this glass sphere to be inhabited by fist, trian What he would do in their would be to decide that

have of this gains alone to be inhabited by the river has been as one of a vill own the surface and the surface of the surface is really nothing else than the student of samething that as a real estatement this surface of the aphre show it. Our plane will be, then, not unlike what private anymous have supposed this interestrial event of or one to be—a more shadow of some other word, to unknown. Boogstriking on the plane, however real in semiclames, will be neverly the student of an unknown.

scottens, will be enried the stadow of an unknown curity satisfies accentance the what will be then the appearance of their bear to the dealer-contract with owned, inspiring the setters framework and individual, on this fathing al-ter and the stadow-eventures moved solv-fars the patter where the glass sphere rests, one the patter with the father sections moved solv-time the patter where the glass sphere rests, one time pattern with a fine particular of well increase size. But so will everything about the harpest size that the will be a supplied to the pattern of the contract of the section of the pattern of the section of the section of the pattern of the section of the

ght on top of the sphere. this point is approached the sindow-creature is-approaches an induite distance from the sphere. producted an infinite diseases from the aginers, to approaches an infinite size for formers, it is to bits, therefore, that the plane on which he is not finite but Harries, it is obless that the souther way, it is obless that the souther way, it is obless that the of all above resistent who can exist on the plane is limited by the number of real shuders plane is limited by the number of real shuders of contrare who can find now - as in . But we

course who can ded room on the Mented form. This pursion, of course, is finite. We is two-dimensional model in which an infinite directed one i industriants to be

The other world seems to its inhabitions to be We see that if is infinite. We are brought to at litterwing question. Here such do we have about our own words; about the security for its the depths of which we like the depths of which we look out whethere we see a star?

depties of which we look out whetever we not a plant. This letting as beat to our problem of the next to our grades. It is deviate, after the illustrations that we have a problem of the section of the station of different varieties of space, each with his own special and different groundry. The discovery of the perplication of a single variety of space may be, to

n within that turiety of mann, an extr difficult matros The relativity these, slow person us, however, more defactions about the hatary of the error that we live in and about the "curvature" of this spetion" being, in one setter, a message of the degree to which the make departs from soriel Excision proerties. More inspertant still the relativity theory mile some deductions about the probable nature pitimate regity which lies, we believe, book of all the ideas which we call by each name as every and there and matter. To enclose the nature and basis of entre of three detections will be the purpose of the future

Is Time the Fourth Dimension! This question will be discussed in Dr. Rushro-eky's next article—on the Descenter number.

articles of this series



4: The plane is of infinite extent; the sphere is finite and unbounded; yet, as the figure illustrates, there is an exact point-to-point correspondence between a set that intelligent belong living in either might mistake it for a surface of the other type. The menting of this model is discussed fully in Dr. Rashyrsky's to

these. Medit assessments have down that gas beliefor madily perfections to after of 10-500 km. Mess arresult forms have their permitting the state of the second of the second actions after an agent permitting the second action after a second of the second of the second act of 10-500 km. Deep permitting twelve very i. Daniely we set only follow to street up to see the 20-500 km. Det then you form any to seen happen. The presence attracts at which believed in "Tays" has a glober sects to travel to very rel, higher than 90-500 km.

I higher than 90,500 km. icidir all serviced light is emitted from the pressed; the thin atmosphere, and not from the of, the establishment for more of the principal of the establishment is the service of the second of the light sole, by a freely or effect, sector of the light sole, by a freely or effect, sector of the light sole, by a freely or effect, sectors of the light sole, by a first proper air. Market State of the State of th

In 1902 Perference Feared of the University of Christiania conserved observations on the annual spectrus, using a spectrague in firsh light power with conditionals dispersion, and a spectrumore. With the conditional spectrum of the condition of the con-graph to entagged the green time, and sid likes in the silver of the condition of the condition of the Section of the Condition of the Condition of the Section of this persistent lines in the supplier band spectrum of room. Although the stronger lines in the exoutcome. According to a single time at the electric page or belles was finish. The time previously connect that the etimophere alone 100 km, about metaly conder of light game had, therefore, to be shattband ner or ups gave ma, meetics, is an ananous.

By comparing the insempty of the green line with that
of the known himmen lines of the annous spectrum
on spectrograms overequesting to the lower and upon
limit of militar spectrus, it was shown not only that the green line, as well as the open lines of the spectrum, belong to mirrown, but also that there are mortal thre-

some hereits is Auroral Spectrum and Upper Atmosphere and district in the spectrum and upper Atmosphere and the tripical introduce electric reliation to one spectrum and upper atmosphere and the spectrum atmosphere and upper atmosphere atmosphere and upper atmosphere at and working with Professor Kennerlings-Chases at the latter's femous less tenseroture leberatory at the University of Leaden, in Helland, decised a method of producing this files of front, wild altrope and of expedite they files to electric refliction so that a miliar green like often identified in the light of the

her inclined to needle to more unknown element upon ext in the supermed brook of the sir By expeding the file of solid alleagen to bendered By expending the time of solid fillenging in requisite-ment by the positively changed particles of the canal may as well as by negatively changed electrons. Pro-Vegard was pitte to elicit, also, estititudal and true litre frequently shorred in the agent. These ten spectrum hands are apparently ideally in the observed in the spectrum of the might sky - thereof from Netwee, May 27, 2824 and residence 4, 1924.

Our Point of View

Our Desting S A Journal derected to the increase of adionos

by without sens reference to that great work of adjustment and reconstitution—the user of the Dawes' plan for the arthresist of without lives this foundation it will be pessible rebaild the dangeral and industrial structure of rose. Good falth, patiency, and untiring industry. with fast a track of optimies, will see the thing Given there, and the world may come back read for more rapidly than even the most hapeful

mang to believe. That this gathering of hostile nations for a ratio discussion of problems which seemed to be imp of adjustment should have required in their autouble in is proof that peace both her victories no less than war. It is a source of deep gracification to be, as It respe to to every American, that, as we were beinful in wineless the war, so, in escal if not greater measure, we have helped to win the peace.

using has called these United States to the list ing position among the great peoples of the earth. For what purpose—to what and? To the end street, that we carry on the great work of disinterested cooperation and conciliation which was so successfully inand a task we see most happily decuments. Our graphical situation retireve as from any fear of ettack. Our yest density, our wealth, the universal erity of our propie, and our unbroken record as makin and pears-keing more, reterm us of say iden of worlder and aggressive gine. We have was the confidence of the world, and in winning that we have wen a priceless possession. For, from this vantage ground, we may become the principal agent in bringing the nations of the world to substitute constiflox, and the calm discussion of the conferen in for the wild fory of the battlefield

Preparedness is Not Militarism BEAT many vell-menting people confuse

navel and relitary preparedness with selltaries. They decried the United States Artsp's "Defense Day" povement of last mith; they besk with grave misplaing upon the observance of New Day this nonth. To each worthy sonia, a warning or a widder in allias anotheres; for each is the 'veryourd and visible size of an inward said traal" bederfinent. In the twisted mind of the effet purifie, a national error and nevy are always and conventure the sundeds of greed, terranger and brate frees, destined to brend valuations at home and

met about To a well-beloped total at army and have and to be an personary for the safety and well-being of the nation as a police free- is for the protection of a manifoldity. The navy on the lifth was and the artist on land enforced the nation and its nationals in the militarus spirit as the policesson on his less audegrands the city and the moule that dwell therein

If New York sales 5,000 man to its police flows, down Nowark or Philodelphia protest that its own sofuty is testation? Does a single-tra and redistribution of the paties have of Circlesol- in the interests of many cause sorred in Detect or Cizeleput? The Scientists: American has almost been a strong dreeste of name and nelliny preparedness and always will be. By far to the Navy is concerned, we believe that its rememel, effects and over allies should cease all criticism of the Treaty and head their energies to keeping our first to to parity with that of Great Reisaln, and that both melien should locally adde by the provisions so wheely into down of the Washincise Conference. To do this will cost manay-very large sures of money—and it is the daily of Congress

to wate locally such appropriations on any approved

by the General Round of the Navy. The Weshington by the torgets magni of the Navy. And westings to These with its \$550 ratio is one of the most implable and productive instruments of seacy that the world has corr secs. Let us be loyal to it and its provisions, and see to it that we maintain the 558 ratio, not only in buttlessly strength but also by building such cred sobnarizes, etc., as the General Board of the Navy

Defense Day, as observed by the Army last in was a movement for passe. Outsidely it was in an enter militaristic. Billion of more were and early sacrified in the World War, because when was break we were utterly unprepared. Ownight, we had to find our which firms could make what. Not only was the process alow and very costly, but it resulted in a trightful disorganization of our industrial bala from which we have per even yet recovered. Defined Day was a test of the evaporate mehitantics of the numbership resortes of the nation. We do not white war; it is interfy abhorment to us; but if it has to be, we wish to be projected to jump in at once with all nor might and finish it up with the least possible

expenditure of time, blood and treasure. Must History Be Re-Fritten?

the effects of the archeologist and the plone may, and indeed must, call for the newriting of serials plants, if not whole periods, of the world's history. Following closely upon the demonstric disclosures of the temb of Tutankhazon. the world has been startled by the searcely less its test finds in Palestine and Ada Minor, to my neth ing of these on our own explaints. And now come a young liaition perfessor with an assembling but apparently well-attented strey of the finding among the mosty and neglected records of an Itelian monas of the whole one hundred and feety-two volumes of a history of Buss, of which less than firsty we

apposed to be in existence. Gibbon's menumental work will be una discovery; for his "Decline and Fall of the Bonnet Expire" consumous at the highest points of Ba ctal newer and solumber under the Appreisas. But Lity's history has really less found, Ferrench "Greatness and Dectine of Some," dealing making with tie Coruce, and perticularly with the great Augusta will stood, if not for perinter, at least for a very notable amplificative and excidences. Although Prof. Ferrers is well adopted in yours, his put means in have been none of its brilliance and fearthwaites, and it is electedy to be hoped that he may be spured to re-

write his great work with the woulth of fresh material which the great Brough Meterion of nineteen contribuup has possibly placed at his overnand. Livy was very burner, and here and there in his there we find touches of sentiment and human that

which, other all, one, perhaps, the cost allering, if he infrequent, design of excisor bistory.

The Man Bekind the Markine T IN se dissipatement of the exercises Dec he hiphone that corried our airms up their 25,000-quile chrumnerigation around the introcki place, Smith and Nelson. The markines that handed at our essent creat were not himsely the same that left upr western count were free mobile upo on their great adverture. Structural regains calling for new material and menty substitutions of new engines ere made during this long-drawn-out flight; for this, in the present state of the art, is an element of the technique of military and consecuted figing in any pert of the weekt. The supreme arbitroment was that of the man being the machine; for the two army then that came through were the same that set or men out of a hundred believed to be true

But the thing has been done, and we w affirm that as a feet of excitined everage, skill as-physical endurance, it exacts unsurpassed in the world-age-long story of advanture-scale (rave). And we say againing story of adventurement travel. And we say this with a till appreciation of the abstraces provided made for the United States Army and Narry, in the way of bene, landings, weather terments, and pride ships strang set along the overse. Greating oil this— and it was absolutely recovery in the present states of the art—this leve serial menigation of the globe is a milecone in the progress of necessarios, whose portunes is attented by the enthusianus with white as were welcomed in every country over wh they flew.

And it may well be that not a little of this a taneous outburst was due to an appreciation of the fitness of things, that the first navigation of the earth uld be accomplished by the country in which are ical flight had its birth and early development.

Bine Ribbon of the Atlant IE experiencement that the "Man an of the transationatic service, has

broken her care impercenting record for th eastward passage, must have brought a thrill of pleasure to many a traveler across the wee Fourteen years ago this same thip, then a conrror, made the run over the old and shorter row New York to Querantows, in 4 days, 10 hours, and 61 minutes at an average speed of 26.06 knots. With her libraries at six everage speed of 26.06 knots. With her libraries at six everage speed of 26.06 knots. of being the first high-speed liner to be driven by then comparatively new attents turbine, and it was ctional speed and reliable receiving of these tw narders that brought about the universal adoption of the turbine in high-speed finers. Sixteen years of crettances service had play-

have with the blading of the "Mauretania" torbine and before she west out of service last year, she wa hard put to it to bold her even with those grant vessel "Mujetic" and "Levistium." So when she was laid off for turtime repairs, it was decided to change her business into all tanks and replace the firement's shared by the oil spray. This change, it about be understood, does not recent up increase in herespower. which still remains at the original 70,000; but it do tions that the steam pressure can be maintained the uptedly from port to port. There is no fall of sure, as in the case of real burning, when half a dosen bollers at a time loss their steam while the fredore are spen and clinkers are being cleaned out of the grains. Retinded and oil-fired, the breaking of her lang-standing record was to be experted, and 12 have a very modern flavor. It is not unlikely that his full history will affect those inclusion, personal glimpes of the uniquie life and character of the sente Romata. analysis of her record trip of 5 days 1 hour and 49 minutes to Cherkony shows that, under favorable conditions of wind and we, the "Matretatia" is don to cut the time below five days. On the third day out she averaged 27.64 knots, and so the last day wit may the 156 miles from Statespie Stock to Cherhoury at has the 150 known areas owners about to consume, as average speed of 27.72 knots, the tide, of control being in her favor. As we go to press wood comps of marcher record, made between New York and Physiosith. of 4 days 21 hours and 57 mitutes. On this occus

> And what of the friend? Shall we see the Mi liner? It is unifiely, at least with steam proposition. The "Mearstonia," fixely unided as a parkt said med with engines and bollers, is the last of he type. The heavy-oil engine is occing along fast; and because of the great economy in agains, weight and finel. It may well reach the point at which a \$0-back ofand lines will prove an attractive peoposition to the

within six days

Here and There



of the day for toons optensively thus it used to; and one of the most meaninged erientife establishments in the rgetown University Coservatory, which occupies a place of emizest repressioning to the field of astropeur, and me of great chalection in the decrease business of month ing serthquides. Much of the pendality for this may be credited to Father Francis & Tendorf, chief selemologist at

Georgetran, He is nictared only developed vertical selecograph. With this inent be expe that he will be able to record more on than have becetches left their entographs in ands, and also that because of his impr ted of registering his information it will get acres to the public more promptly, more fully, and in more effly available shaps. Our maders will probably tilts that most of the litera which they are in the realize that need or the items where may need as one disky years with reference to observations of morth-quature as seasy niles out to see in this, that or the other quatter come from Washington, and have been made with the Georgeton appearates. Now this most referring the Company of the designer of the instru-ctions of the company of the designer of the instru-

mente which he uses in his detir -A SLIP of the editorial appearater which occ to see editorial page for June was so obvious that most of our readers must have corrected it mentally while reading the sentence in which it occurred; yet we feel that it parries recognition and formal correction. We were pointing out the success with which the provisions made for food methol in the Panesse Canal had functioned in the unprendented high-water period of the past spring, and reverting to the arguments edisanced in ferror of pra-level and of lock canals at the

time of construction. Plately enough, the shifty of the existing capel to take care of the present fixed to which it has been subjected in thethroug as to the avendone of its engineering, and we assume that all our readers know that it is a lock canal and not a section one. But through some abstration of original distation or of com-position and proof-reading we credited this directial to the sea-level canal which

MONG those to call our attention to the misprist was Ool. Jay J. Morrow,

or of the Caret. We take this opportunity not off to acknowledge the correction and the error to which it periods, but to present the pertrait of Gel. Morrow as that of a very efficient military administrators and (on the fact of the evidence) a reader of the SCHOTTOR AMERICAN. At va-

rives times during his active Army career Col. Morryw has been savigned to afte tire duties, first to the Philip pitter and later (more than more) in Patricus. Illa variota terms as Arring Governor in the latter territory culturated be-ble arrival assessment of

the Governorskip in Herri. 1922, and he has held it ever since, though retired from active Array parties at his ONE request in August, 1922. new in typical of the na echool of military

CIMNUE gets izon the news THERE will be no convictable question to the mind of any product as to the materiality of the formidable regatebases at the lower left corner of the page. face could not possibly be other than that of water Herr Professor. It is in fact that of the worthy Dr. Histor, of the Toristiche Liebetoie, of Berlie, wirhas broken boto print lately as the discovery of a method of extracting gold from mercury. It is an interesting mark of the extraordinary evertura which the fundamentals of physical science have underconthat where twenty years upo this claim would have been net with spelling references to medieval abdume. today we all take it so a matter of course that it should be intrinsically possible to convert mercury into gold, so that the only raising of eyeleness which we do in the prosence of Dr. Misthe's chiless is with retenence to their commercial practicability. Here skeptician is supply budded, so far as his present showing to see,

> recovery of a Sallar's worth of gold other his technique create no less than \$60,000. Apparently by has some distance to go before he reaches the stock-selling stage; and in fact, we carry his picture, and when in the to the county are present, and refer to his work, makely by way of ex-planeither the fact that now revented stary physicist would expect like to pt was gold out of mercury, if the end

of the work is no forter ONE of the crotice tasks of primes to which the layman gives perhaps less thought than it deserves in the determination of the exact time. We set our weather by the Western Union hall or by the clock in the Jeweler's window, with little or no harmleign of just here and

why we may be so combined that it is exactly need when this authority tells us on. reast wip we may have this custions is pictured beywith—Paul Bellesberger, member of the automora-cal staff at the United States Nama Observatory. See

Is fact is the man who actually talls the world when it is noon. The cylinder at which he is standing in the picture is a chronograph connected with the Observatory's etaphant dock best in a trible wall for reducgreend, where there is no vibrative and by dast, and where the temperature prior racks by eres the fraction of a day At 11:55 by the chrongraph, Mr. Solen-begar closes the switch in the circuit that ticks of the security for the causing for just before the critical inexact, the first signal that marks the agrical of this in-

stant, are likewise of his making; then he is through with his public motors—for another twentyfor learn A LIKE in point and in laboratory, much amended in being given these days to the divinions of emlution. And, of mome, the problem gers broader and

broader the longer we quantiler it. A cetter unwest Verspeint in that of Eletiey ? Mather, Producer of Geology at Decains Chirersty, where portrait brack the third column. Peat Mather recently got his name is the papers in orapectics with his requests at a gathering of the National Arademy of Science. He dec that seince and history job in showing that ifth dave not progress from simple to excepter, or from lowly organisms to higher types, or from primitive to circlised conditions as a natural and necessary thing. He pirtares the belief in such progress as a network, a trans-lative into modern language and mydern shought of the same these that led the tireds to picture the beautily begins as moving to rimine because the circle was what they regarded as the perfect figure—a. In-thering of the daught by the wide, in other words. From Mathew belows that in the natural course of From Mathew thereon that the de-

enests a list of good things go het, and a let of had taken are main good; and he pictures the environment on the cone, breetr accidental. all this Invidentally, just by is a theresis actor scientife icunoctus, by denies that other becoming bedien than the carm are inhabited, in duting that the life on the cents is unless to time and to meet. We present his sirent and his face, of owner, not at



certain, for one account carries the contension that the

THE Occupacy of the Frank's Institute, colebrated an Replember 17, heappy forward some addresses of extracedizary interest from problemen who are in a position to tell to senething about the character of the zeat war, if there come known for life work in the Signal Corps teld his audience of an anesthetic gas developed to replace potent gas, will would be available in sufficient quantity to be used from strokens anxion the entire civil population of a evapletant na tion. Thus arattered, it would put the nation to sleep as one cost for a perior of two days, after which they won't wake up, presumably, to find the connected and rectated by a buttle ma

marked from the Particle Chief of the Army Air Service, telking about rideriess planes pilotes In sworms he a stagle controller at a distant make secial currents that pullify paracufors, and breaks th would wise out a luttimble with a single bit, expe the belief that what we did in 1918 can perce be d expla-ries the indeportation of any consider expeditionary from arrow the was has become an other impossibility. Meanwhile it is anneared that there is to be stuped seen at the Aberdeen Proving Ground a special descentration of these secritic agents of modern worfare, were of the American engineer accieties being the greate

INTERESTENCE figures of contemporary sciencide wa I are not recoverily of the male personnies. And if niso examine of good work in the direction of beneficial scientific effort. The young lady whose pertrait adjets, for instance, is a member of the stoff of the New Tork City Board of Heelth; said one of her partie duties is seeing that the water that washes the Nes Tork bearing is fit also to wash the New York bethers The procedure is the arres or less familier one of make ing culture teems to determine the harterial customs or the waters; and when Dr. Haddelt doesn't like what she finds in them, she is upt to order up the "Ne Furthing" rigge until the cuture in testaned and edged nated. This has reference, of

course, to the program of actual nuthameter comprises and but merely to that of Swifter garbage, brought beck to sheer by afterne curre from larger that did not at take the Board of Beath to fed reliation of the latter rhammerier, no indignees better from the Jersey shore reserts





Od Jar J. Morror

Listening to the Stars

How the Night Skies Regulate the Clocks of France, Without the Aid of Any Human Hand



M. Jecaust in his laboratory, assembling the phe electric apparatus for converting light into see

there is about to come the marke of the sphere. All last the instruction of the sphere. All last the instruction state of the sphere. All last the instruction state will be provided by the sphere of the sphere of

Najawa, a few mentas freeza new, that you are blass in an a year raide overless excellent in France for the statety time signal from the great mello stateties for the second of the EDD Treese. As the second new approaches you will be be because of the second stateties of a sear. As the mean second statet means the legislating of the new day that mental more will change skappin in 1910. That thele you when to set your ricks. The set that the does he may be not for all Trees and the second stateties are now illustrate, under the wint.

But you ricks. The set that the the me not for all Treese has good, librarily, under the wint.

But the second of the set of the second stateties of the second stateties.

match-decisioned per method of "busings startight" for veloped by two French wienteds and radio objects (General Housew Ferril and Monalese R. Lousses. It is an improved method of fixing and distributing the standard time. Lories as we shall see, it may prove to be such more.

The student that for all the world is set benefit by the stars but the article requires the interesting of a hance worlder. An advance of a hance worlder of the hance of a hance worlder of the hance of a hance of the star of the hance of the

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The difficulty about this has been the need of softine the entreasure. The bosons holy at its best is at uncertain and fulfillie instrument. Knop networked to possesse what is called his "personal equation," that is, the inswert of time that he revise he see the starcount the wire, he suffection that it has crossed and to prove the bottom or give the white edgal of some high pitch ways to the waiting offset that the same has

due what was expected of it. These permitted expectations differ the different attenueurs. Tray differ, syen, the the value activations at different titters, depending, the example, such ther design is for a graph what he had not been assured to the second state of the second state of

for, he is tille it tearning. The source of the a call heritard is around. For either propose it is not heritard in around. For either propose it is not heritard in around. For either propose it is not seen at the call of a control of the call of

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This view gives a better ides of the apparetus and the way it is put together

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to the manuf This is enaming but unknowned. The chief that is that between them these two remarkable and neglest purious laws given a great new eleminist changed; in. The hearing of the sun legion with a device child a photo-electric cell, identical here laws the many in the part when the certain naturals, enough then the metal present man about to give of many particular of also pursuance, are able to give of many particular of also

personnes, see able to give of manife perceives of sections, see able to give of manifest perceives of sections, see all sections, see a section of sections, and the section of sections of sections

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The half for the satellite reperiones centrals, may be the pilled or satellite potantion protected by an attemption of these produced particles of the produced particles in particles of the satellite particles and particles of the particle particles of the particle particles of the p

tributation of marin and method golder, on it. Types the against the about of this production is the test and the against the about of this production. He are likely of these stress are signify demagned. They are shown to be about the control from a suitable success of now your through the little glass both correct entire out now your through the little glass both correct entire on now your through the little glass both correct entire the plate of potention and the latert as thereto, it has plate of potention and the latert as thereto.



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If this takes place, you make remember, on an orthogoly nitrie scale. The they perfolies of electricity that by off these he potentiary below which the high ray lake it are no assail that essentially illust a serious continue minima of these conditions minima of these conditions of these conditions of the serious of the text pas bandle the high see with your about of the text pas bandle the high see with your about the same of the text pas bandle the high see with your about the same class of the serious of the text particular times hope class this. The whole proved electric particular storms already of an extraction of the serious and all of a serious and all of an extraction of the serious and all of a serious and all of an extractions are all of an extraction of the serious and all of an extraction of the serious and all of an extraction of the serious and all of an extractions are all of the serious and all of an extractions are all of the serious and all of an extractions are all of the serious and all of an extractions are all of the serious and all of the serious are all of the serious and all of the serious are all of the serious and all of the serious are all of the serious and all of the serious are all of the serious and all of the serious are all of the serious and all of the serious are all the ser the pieces, stone, electric currents and all of it then piece in a space not much larger than the hand of a restch.

Now we have the startight on Now we have the startight observed squeezhilds this ag electric signal sell towards custode the plan help of the small photo-electric cell. Here, in summary, is what has largement. The ory of light from the size has sixtend up the particles of electricity to dy off rows the planation plant. These particles how this against and damaged the atmost of the fract gas. These direc-taged storms have effected the descript construction. This change has been detected by the shetric

experience outside.

All this has happened in a time on triffing as to be negligible. The complete sequence of changes requires, so far in we can now determine, securiting like a Hone's of a second

Now how is this applied to the sending out of the you have a run appared to the setting out of the algorith by runtile? The development of radio science to its present autom-labing dimensions depends impire uson that constraints inventors, the various rate. What the vaccins that is, its constra, is a inference for electricity. If you have a very clay convent of shortheity, for too thip to be between it any ordinary way, you can egyly the extract to a versus table and tyreshed that the stortheir correct is an absentage and the vaccine relig-mentally some tity object that you cannot see, for excepts an table of every contract, who have Table in what Good on Ferrife and M. Josensta been done to that this section contract produced by the stan-dars to the tity assective contract produced by the stantion current of electricity, far too thay to be

Aght in their photo-electric cell.

By using a series of various tabes together with a my using a series of variant sides together with a more or less completed indic opportune of bisser-mality in the raido neglacer, they magnify the sing-statispic current until it is small example to be sent our one the raido 33 the usual way. The reconcendenof these waves into sound, so that any French lister on hear them in his receiver, innuives mething good, It is surely what is dute every day in hearing the ordinary broadcasts.

erdinary broadcasts.
The essential thing about the investion is the original conversion of the startight into electric energy and than 1930 the radio wave. The thay photoelectric cell is the instrument upon which the stars will play the master than the property of the paster will play the

The application of this device to the practical measurement of these in quite single. At the opposes of the intercept the little spot of an atomourer is replaced by the photoelectric cell. The intercept is potent, on usual, at the desired start. The ray of light from the star than fails on the photo-electric cell just

from it need to do us the retins of the satesment on pa-m it need to do us the retins of the satesment's ope The described sequence of electric changes then taken place and an applicar note force the star is bested in the radio receiver. Blesty the star wover some the field of the tele the trimenum with it on that the star appears to but across the bioscopic field of view. Presently the issues of the sign approaches the cross wire startified atmos

As the over needed bottled this wire, the Butt For de the ear place sense to week the upon to centre from it is eat off for a single instant. Intro-dictely, the stablele note of the rolls province changes. That first, automatically and trechanteally. the liat of passage of the star. stati of passage of the star.

This for the utilization of the best device has actually been accomplished. The pentises that themes!

Pentis and M. Joseph set on the active was how to

estates standard they meripatedly. It has been mathifies for the use of studies methods in other



ring the two-grid take (below) shown fitted on to the other part containing the cell

verte light late electricity. It is a new kind of oursey expectate. Ruch convenients and extractions of energy are the haste of all maders designation. The serious engineers have taken taken the dynamic matter the dynamic method and the dynamic file of the convenients in this observable file. ment in an electric lang convers electricity into light : the releasings regrests want has electricly or elecrelefty into accord.

by late sepad.

Deep may be classified in six groups; best, light,

responding affairs. For media, electricity, separt, and descript affairly. For a complete new of energy in the world we regist to be table to correct each of these kinds, at will, into any other hash. In properties as unabled has well-of these conversaless civilization has solutioned. Here of these have been solved, he now, with fell stateous But there is one that has not been solved untidac-torily, or at least it had not been solved up to the browdgathete that we are now considering. This is sension of light into electricity. We had not verted electricity into High! by the electric lange; the reverse extremine had been made only with indifferent

ere base been deviced, of organo, such landrage There have been deviced, of collect, such interpretate the meleciting with used in the operations of Dr. nursier d'Albe and in the tuness "electric dog," a closs scientific bay that will follow a light superiors at it goes, defining and turbing as the past of the



The midder is opening the telescope shutter in expuse the photo-electric cell, while the other open

Betr day. But these drains have poor been o The proportion of the light converted by a selection with into electricity is very small and the operation of the increasing is undependent in other ways. It has already been attempted, for example, in apply these solution cells to the neutronical of startight but without success. The selection is noticed

explifer enough mir accorde cough for me will and feels light rave as these But the photo-electric cell of M. Johnson and its arrangements rath, apparetus they, at last, arranged this convenies. What it may lead to only a bold me melé den revice

neld day product Perlage the impost store of energy available to 20 the form of light. This is the eserespace to him in the form of light. enters to time in the torns of ignat. This is the end of explicit. If all the explicit that falls on the b workers of the earth in a single they could be came and seved for the use of man, it would equal the p able from elater billion tree of coa the day's smillest would run all the factories, talk-way traits and steamships of the whole world for name than from; thousand your? The trauble is that we cannot not this smillest. We have not been able to convert it late other and uses useful forms of

Any nor to expect, then, to see the desert areas the earth control property with yest photo-electric or tity smight and converting its energy so that B can be distributed over the earth in the form of radio It is unlikely, although almost staything in Jist the world has gained, in these remoperiments of General Ferrit and M. Jonanet, the fire stop toward searching of this seet. When Bern of Alexandria built his first seven propried toy, it did

not seem thety that he was sheet to under over the world. The first electric heaps that Mr Edison begin to play with were some selectific type. White Setude Marroni first seni a few feeble facts and dashes through a few landered yearly of other, no one foreign pightly secretion of the booders' broadcast ed States alone. The first steps of wieters are as feeter and to as the first strps of a haby. But sciences, like bobles

later a way of growing up. my wavenedulty into an electric signal, into a Bent | sound, into a mechanical motion in a rivel. Here and Edwar and Murcoal did not agreenplies, at first, even

that ment increases of Person radio arises to the demonstrator recesses bate of the Medicani redio take that recess appears for reports. Mr. Redi mbs is our special correspondent to Paris, will de-



Help Us Study the Solar Eclipse

The Radio Listeners of America Are Invited to Assist the Scientific American's Study of Static, Fading, and Other Radio Effects During the Total Eclipse of the Sun Next January

of America will have an unusual oppor-tuates to redder real merice to acknow, reportally to racks acknow, On the sun, one of very fire total eclipse of the sun, one of very fire total eclipses that have been visible in the thirkly-ectied area of the stern States since the North Assertian cuttinent was overpress by the waters.
The path of the total shadow is shown on the map printed above. Huffals, Itines, New Heren and multy other clies are near to center. New York City in just at the markets edge of the strin of nearliv.

Preferencial infranciers at the great observaportes are already making preparations for scientife work. The trails of the Emodel Though the suptors, of the same course, the remerkable "chander hands" that atterities accompany offices; all these and many other phenomena will be carefully observed by trained ther periodic with the best of instrumental equipment.

But there are some things that another observers.

the entire for Some there is a state of the entire to the entire to the entire the entire or specimens, can do to belp in particular, there are important things that radio fails can do.

Last your in California there was another ordine of The westive was rivery and the mentausers not only were few rhotserstelle or observations dering the college heard many remarkable things

But the few radio face who had arranged to listen As the sun's shadow sweet returned to the speed of a through talks in last, the library of rath signals anticols increased, then suddenly decreased. The bell tet suite the same. The observer on duty for

tee few to permit certainty.

Be we are left with the question of what a solut

Does the standow path behave like any other variety of derinew? Does it openter as a reflecting mirror to small back ratio wome toward their point of origin, or does it bend them in one direction or mother, or easy will the light from the small be cut of the above the stream of electrons fifth it augment to be dyna-uit the time invast the surple will be altered. What offers will this have on made transmission." No the leaves the anterior to these questions. The SURFITTE AMERICAN proposal to these questions. The SURFITTE AMERICAN proposal to try to enswer them. A group of qualified table induces and another will be formed and instrument. Special alguns will be extract to by selected beneficiating stations. The listment

Radio Fans Attention

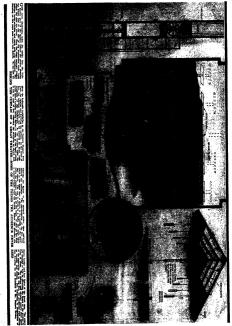
Help us find out what the ordines of the sun do to radio. If you are willing to help, and following information at once to our Ex Editor. He same to otsaver ALL the question i. Your same and wall address. 2. What is the make and design of your receiver?

2. What kind and play of extreme do you up L. Do you use storage betteries or dry celle! 5. Are you located in open munity or in town?
6. Here long hore you term a radio faul! 7. If you have on amoteur license will you be writing to and algorie if we can you to, marked

> The Eclipse Editor. Вспрутите Ажи CENTERC AMERICAN, SEE Broodense, New York, N. Y.

will keep accurately timed records of signal at feding, studie, and other fretures of redis rec-after the eclipse a consultine of fatonia radio may will study this mass of infernation and will try

Off state of the contract of the city of t



Our Post-War Navv

Maintaining the Fleet on the Treaty Basis By Commander H. C. Dinger, U. S. N.

a considerable ratest, our hallelles sailer, which as now carried on ingleting paray, was it, as now controlled in the proper maintenance of the Treaty News Bertindage and airof the Treaty Navy Berthedition and ready couriers are Besthed, but also effecerities and applicanty towers are fed These latter need be fluided only by the up-- speropriarieza alsanii le whelf is evering the weeks that are of greatest twisthe veltar for carries out the names point of the corner. Morey should be west only on such treats as any situally pressure and for

descriptional need outsts. Furthermore decision must be ready to to law treels priority in to be avolated here executive in a weight rependitures for polynolities ear proved needs in course executing condition. As it is approximate to maintain observe equipment in repair the process of educinoting mercential material and per-manel most also be structive etc. Nucl. has been justed in the past ten years but in the interest of content and insul ef-

fictory there is still augh more that should be limbed. The par has served to breek manages kneets, many of which have not been fully learned and many which may never Near of the principal lowest amount

to be:
(a) The great dependence that room be placed upon the nervised marine for both natetial and personnel. dister of the resistry to produce motorial

best.

one of the reality of presses necessarily was in all (r) The great productor in these industrial times injustic property to consider and condition denied caffe (d) The great effect of new developments in all cuit, estructes, titus, mile reconstruire and gotting devices.

(c) The group need for better expression and posteroi

understanding between the military, most and indigen-trial forces of the country. Such conjugation will re-eat in greater efficiency and a considerable contemp to constitute. The receipt for mobiliting the adentife talent

of the country to societ in solving the various pools that your rewest themselves to the saval and military tre of baving definite p sed well-defined skeleton organization for colds ex-

publics itto war-flow activities. The trapetages of tide was very firefully lavegar to the attention of the centry during the caredes and publications of De-

In spice of possible fature developes under the surface of the water, the nagion operation in a based war will content occurs the two fighting firsts, the executal most of which is such up of earlier These will be, as they have been in the past result heartly arrived and protected and built primarily treates seattly attack and protected and built primarily to oppose the organisi otheris of the speny. Nach we-wis use a devalued consequable between arrangement. percerties, speed, sudarane, and see hearing qualities, limit of these essential qualities must be developed to the profile limit without units detroting from the other. The later designed United States but helper

W.E. commend this article to the coreful personal of every roting citizen who tolers an intelligent interest in the United States Navy. Before the war the SCEENTERIC AMERICAN urged that our Navy. to be truly adequate and representative, should be increased and streng to be this streption of prinsentable, about be normaled and streption of control and it is that describ in strengt, because the most it movement. Take, the soul is strength, thereigh as possible, thereigh are possible to the strength of t

the trainer of these results that can be construct. The present design can be improved upon by refer the familier and increasing the outlier of the gas for T-bank game in stayer can ascens on center would be better then the present arrangement of 12 inhigh game is nominal. The contributy refers construction in the present in the another than the trainer where present within this another the refer the present in the present in the another than the present in the prese

number of singlianes can be carried.
To accomplish the above, the side of weeth nees to increased in displacement over about 9000 total the basis of residue per money expended it is not detailed to unfairly increase the size of these varieties to unfairly increase the size of these varieties. If they are kept within reasonable limit muster can be built for the same pages.

cost about \$5,000,000 apiece. The Navy is not restrict as to this type and therefore a littled transfer of the where you be jet under while the next few years. The development of the beary bopol-

plane makes the operation of the rough truber within 500 sales of a bombing air station rather risky. However, there is will a large part of the ocean outside of this radius. name returned, in conjunction will a number of destroyers and substantion will taske a very formidable scoribin unit-rapolite of searching out onessy advances bases, and attacking troop transports or

everyon of unreclaim states when a street every of sweetson super more court in successful. Another role will the apprehension of another stancy was be the approb of reck a developed community. They are present Aircraft Tenders and Caprillers
In order that the Navy may hable full universage of
aircraft development, both aircraft tenders and airplane curriers should be provided for "Ven of the
battle cruters are now belta; retreated this airplane carrying the leaving amazawat and greated production considered with great craising stellar and felt speed

The took likely improvement in buttleship design:

(1) In convictor better efficers assignt and protection incide crainers are not being requested this algorithm confrient other completion may be expected in all two yeards. These two should grown very serviceable and the property of the completion of the completion of should now explayed as readers for alternat, but in a source of less linguished mentager. The "Langley" is an experimental currier world to forestip system, for which as serviced of the completion of the completio tion from alternati.
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foreignment of the first the crubing audits of each
foreignment of the first orients. under construction in the over future and at long two more abrereft tendens should be provided either by building entirely new ships or by correcting same of the treases tolors over from the Bidgeling Board. Nach termis on he converted litto aircraft tenders, but not late curriers. The two aircraft corriers are along the

special machinery for ter at his craising spe Scoots or Light Craisers The late scrat craisers are nessele of hig

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lited to by down the water years. Their existraction wests were to keep were of our shippards in hand on arrel be vers

Destroyers and Submarizon The true devotesed during the war is a very satisfactory one and the United States has a large number of these-Consideratio some will have to be spent to maintain these in confiden. Ginin set directains of the total number are la active section.

the United States has a very re-specially aggregation of enhancines and the houts of the '0,' 'E' and '8' classes toty be considered very notice. feeture (may A considerable remine Chose are still to the builde

Three of the large first type spi-turities are abe building. These are large and very costly reason and the success of these large high-speed safe-tearities is a matter of delete. The finite larger tree of athenrips is now about from the Naty progra sad II would spoor project that in the next subsection to be tald down the silbs layer type to included If we are to hore a Navy at all worth while, the presented and material must be kept up, which such limits of separatification as Congress may set. The

limits of expanditures as Congress may set. The building of new vessels and the making of new devices suget be entitized, else progress atili close. The deal wood both in natorial affect and stations ashere should be eliminated. The printing inite may yet be applied with good effect to tourserves stations that make heavy laneds on panel fracts and give wer little in return Motor three waved should be not into medal experi-Touters and Rases for Submarines and Aircraft.

away from the home creat requires new developments: in the way of traders and have. Traders are travely in the way of theses and news. Treatmen to increase averable bases. Our certifup nevel have a found of accreainty to provided with alternal and subsection buffation the their defense as well as for marrying at effection operations. The late was clearly indicated that sealor name operations will be carried as from on and that navel bases properly maintained stable the revol force to oppiral the my. In our factor we sizeraft and enhancing with listening devices will play a very important role. There are agencies, to pother with especial radio development, have revelletionized the nactor of securing and communications, as well as the handling of secrets and commys. Developrest of anti-silvarities and anti-sircraft equipment is used inspertant and our paral bases should be well exciteded with tactilities for radio communication and likeling devices. The very much extend approxim-

fixed, with fastimes to make related appropriate of the past two years and the expense of making too large a number of weaks in active serious programs of explaining too large a number of weaks in active serious the present or within his appropriate to prevent to prevent or or expensional propriate the programs of the programs of the programs of the programs have, as less finds are required from the programs of the programs of the programs of the making the programs of the making the programs of the progr a la operation, sorce ged, sizes these will be in see. Navy yards are needed

The rave Importure Sand actiaire to them of reace in PARTER IN THE REPORT OF note for the purpose of de-relepting all number of presitie weeping derives and o is continuing the This work to absure in the pr of being neglected in those of press, pet 9 is that which gives the largest re-

tume for the many spect specific. It, therefore, bebronze these desiring results from our name expenditure to see that experimental and

in the next twenty pears, may be increased or decreased 10 or 12 per rest with-self materially alteriag next efficiency. When a keyer' force is allowed, more facilities may not recluded white the appropriations have to be interest to pay for this the team counterest of the Novy at our separates speer upon the number of nen who have graduated through munit training and our, be made available for wroter on short petter. The provinces receive of net service on short notice. The newlecter proper of net tening for mortal service should be the reportion also of the party notice than the continuous service of numbers poster of men The nava in secon time should be a testifug school for personnel that run be available for common in one of war. A suffered like venerie is service and carry on the training Eighty-flue theorem is not no life on allowance. It

for 2 is the minimum with which may emblance of twintnings the Touty Kary can be attempted Let us togo the nonlinear nearlest of men that the except aspendation will result. The number actual is section in feet a tectoric of our naval equality, but It is a measure of our especity to b It is inverse, any contribit to been up un effecter Norel Movem tirelarly the Flort Breeve, and to be press its efficience. It is from this menter that the naval personnel will be engennied in thre of hestillies. The

permanent force in money a murbers of the war-time force. This feadarons fact must per be lest sight of, either by the Navy or by the public The great rewalful thing in beeping to and improving the Naval Boserve in to see that the organization of the parall districts upder the district economication so to to love a famorate and off

nice on short notice. The country years must measurily be expenditures. The New post do its short in brights out this recovery or rise

the Newy is greated authorretard of at least \$5,000 can be maintained within The Nath, harrow, most not only be willing but armiets to cut out all por slide excess of waste The Kery is, as yet, not Property sta tions strept not be bept in operation and those kept syrvitie should

most reseasoirable adore istered. The whole per weed allowed most rectally considered the nisir 12 matte her of pendescript washing that are not executed for as pro-esertial district



exerted and the bulls natured



at Venire. descent with flow in become of sugh our Novy is short of light, fast crubers, we have ten, tensition tag. I storgs duringly is about in agin, and consent we serve the file the above, that are among the fastest and most powerfully armed in the world. In the distance is Salato Charch, which is a familiar feature in many of larger's pictures. These remeds are 510 feet long, and of 5000 ions displace-

not no



The U. S. hat



Six-Meter Team Race

Third Series of Contests for the International Cup at prompted the lead to Chicke's "Low," which seems to be above up. mank" by or of for its small behalf in Baltin size. "Low," has been chosen for the most two ones.

other of a cop to be rated for by such before the by such before the property of the property

The distorter bette are designed under the Romerland rike of learn-riser, studie also in ellectromatical rike of learn-riser, studie also in ellectromaland that reagented corrisates, which was designed by the resigned corrisates, which was deresided by the resigned correction of the contraction of the resigned correction of the cortex of the correction of the correction of the cortex of the cortex of the correction of the cortex of th

It was involvable that the designers of each country should have in adult the providing best insulative and should have in adult the providing best insulative and ledge bload Second the providing assumer which are lated unit the was sworth. In the Emphi Churant have taken as front, the tiles extend and the east are unsuffly deeper, lated without some speed, and no now speed the chief medicates is the shall retreat the lates and the chiefer to be sufficient to the con-off weight lates, it is desirable to keep does not be more of weight sufficient to the chiefer to keep does not be more of weight general Tweetlier help, with shad covidings. But it is

significant in an another of the absorbed means.

And the state of the state of the absorbed means.

And the state of the

owner, an austicer who design his over 1000. The treer 21th beats are 22 does in deed by 17 feet Design, the "glad" is 25 feet by only 6 feet 2 inches bean. "Seath" is the best base on he cross, Lunius, we is died this year in Jethili vessers to 8 frees by "Best". "Sold reason will be in the second said to "Best". "Sold reason will be in the second said to "The cross were saided off these Bay. The first, were a wishlowed and leasured cover, we all tower with a good invesse of 12 hands, with yelfs of 16 kinsts. "Belty" and "Evenswick" freed belter was of the limit. sease, by ever a minute and a laff, with "Bestiffment yet minute seat of "Systemson." The Strickwas with Skip potent to 17 for the American. Trease of the Strick of the Strick of the Strick of the sease of the Strick of the Strick of the Strick The second raw, salled in an Strick tensor and seaseder as one of Educative court, was one by seaseder as one of Educative court, was one by seaseder as one of Educative court, was one by foreign annihilation when "Stoke," on the port that, "These Gained the Star board in third place, but the Strick of the Strick of the Strick of the "These Gained of the Strick of the Strick of the "These Gained of the Strick of the Strick of the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Dribbs less yellow away on the "Strick," small the Strick of the Strick of the Strick of the "Strick," small the Strick of the Stric

A series. It fields "P by" (T Terminal Core British Barriers) Barriers by the property of the

and she came in third. There was no mishap to the Assertion beats and although for the third time a Britisher (this time "Kein") led the first boxes, the

end to an all matter and a loss which is in an and if influent risk the "Paris" is in the Per Home, the control of "These," the control of the Per Home, the control "These," the control of the Per Home, the control "These," the control of the Per Home, the control "These," the control of the Per Home, the control "These "Per Home, the Control "These," the control of the Per Home, the control "These "Per Home, the Control "The Per Home, t



is," a Gardner bott: fast in light airs, which was second, I the heavy blow that dismasted two boats

STATE OF THE PARTY OF THE PARTY

The limited won the fourth race, with 1944 points to "Betty" held the load throughout the race. She closely followed by "Heron," which salled well in breeze of 50 to 12 knots, and was 1 min. 13 seconds ind her at the finish, with "Zenith" 15 seconds een of "Herno. The 10th race, salled in a typical, light, explanes one saw the most thrilling duel of the contracts, be-

before the fittiel, "Datphin" was 26 securis shoul of "Zonith," and in the run down the wind. "Senith" street paint of sailing, she from up level, passing "Despite" at the line and winning to only one second. feet, Neure in prints, Assertes 20, tile Defin 1836.

light winds characterized the sixth race, in which Despite we by 21 seconds over "Harts" and 48 seconds over "Earts" and 48 seconds over "Earts" and 48 seconds over "Earts" the second non, she finish, while on the part task, a competitud on the starbard tork and was disqualified British 20%, American 14.

The arrests and decisive race (the score stand) The arrests and inclusive face (the score statistics 3 all I was wan by the British with a sever of 21% to 35 points. "Swith," which held from start to finish, sailed supprisingly well in the light broads, finishing I min. 22 eer, about of "Lee," berself a resu ship light, weather hout. The first water in these true four to these

closely the teams were matched to shamp, however, he the sever in prints of 129% to 121. Although the emp brogges the permitted precision of the victors, it be prefeite that mather ups will be effected and the frited noting in these fine houts propertunted

SCIENTIFIC AMERICAN

Lubricating the Flanges of Locomotive Wheels A GEZET may things we do become as very con-margainer that it never secure to us to question then. One of these recens which has run along bury decides "on recognizing" as to speak, is the radioist of labeleathen of the flatges of railway relilag stock. Here is a play where there is often a great deal of friction-respectably in newart years, where great data or minimorphysically in never years, were beiling stock in very local. Flatgace, especially those of heavy lecenation, near thin and break, cutoful dendinents. Taking in coulderable at least triple there are leadings of where with faggree all triple rt of the time to fide up or elich the tail became of the exec being threath to one offe or the other When a curve is hill the tradeter to ride up and over

is, of everse, very great and if the speed of the lor-tentive is kept above the critical print this will happen A Chicago, Hillards, transfertners has worked out a methal of loveltar the fanges intriested without much thefinal of lawying the manages materiales where aftestion from the train crew. This offer work the train is in metion and stops when it stops This offer works will Oil is fed by air pressure norking through toler which control up with special oil above making control with the figures. This six pressure is controlled by mire expected to the relias lar or take stem of the beneative. This valve needs air pressure to the

the sentrative. This show needs are present on the theirance fire a manner of each tendered resolution of the driving wheels. This needers the Chestery of a of the driving wheels. tree deep into the collabora in the labelance a separated execute of oil to the above on the fluxe-in cold weather warm nir is used to force the oil on through the pipes, so that it will not become two viscous for may application to the flaggers.



tire and (right) shown in detal

The Earth Inductor Company A VIATORS have never been able to trake satisfactor, me of the common market's compani-For one thrug, the company card is altopother for but to altrations. It is not "load leat". Yet Yet fiving the clouds in sensetinous desirable and will pend able because more and more so with advancement printing us a partied of travel when we begin to

Infor substitute of the extremely high sized relection at high additions above all rheads. Long journey across unexpliced areas, others there are fire or to institutely and as the lightof chiles at alget, will obe make this sort of flight a problem

with manufacturer has alarment a heard ren marked of feeling street! In places the this, or rather leading street found. The carib in durier resupose, invested in Nr. 31 M. Titterington, tenker use of the store tank mells hald of the earth which directs the control mediter's rengue, except that It makes the of it in a new you If one were to take a processor of the cells altegrater, and then come the arm tare to be residend a carrent would be generated. This current notif be we of course but it would don broken the may meal lipes of they of the nuttle would have been out to some of the cold, unless the lengths were placed to seek a man

but with them was parallel with the line of flex of the costs.

This is just what takes place in the eth laducter coupus. Plast there is the proceeder It has & APILE offer for mile-of me has recently been A freeless for nellessing for his recently town A developed by a Chrotopi, this, nazarlaturer, which is about the next feedbe, calculate sect of an implement imaginable. The pile-dricting gare is carried period shell which extract high creeps to take a small inscribe fast, level general to its end. This keeps the smuttee revelity in the place flex, although and over he effected by any other mount desired. Here on the center and of a being trace in each is was that care if the brasine are so stand on the recognitates niles man be defore anywhere which a redies of of any given narrows of flight that likes of ferre are IC feet. Dust existing over he done by rhanging the out in the artististic cells responsible in correct with positive of the track width carries the whole murbles the brashos, a current will be generated. That curre will come a reading to appear on the saster, which is duals a correct colimeter

The corollary of this is that if one storts the plan in such a matter that the cell in question is kep model to the line, of force, no results; will be observed. Then still that remains to do be be provide at to their by newton of a locality working on a Gol. Stars where head magnetic influences from to the engine and antelephone, this commercian is much in records of a long shaft, with estitable teggle joints wherever a direct lin-

In practice, if the more required in class renery let us up. South 30 degrees West, the little handle is set on the died at that point (see Historia best bis our on the hand of the upster and see that i does not get away from new reading, or bring it berk

The plenes which have been engaged in fixing 'read' the world are conferred with these month industry over power, and they have presed lightly volunties in that reced flight. A number of planes in both the two



ONE of the last places in the world in which one would expect to find previous states would be in the stress of Tel. new and equip, extensions white closely revenile squis and pearls are discovered in certain plants. The ghan ingled lumber gree in Plance to the height of one handest feet in the young stages of growth the hollow stitus of the bumbons are filled with a july-like selectance. As thus goes on this post klaren as triandeer is formed. Stop abres stiff and strong by, now and again. there is an excess of the mineral added attles in more or less rounded insure of the joints of the street. There are pair in or white in order and, on being heated new brighth plantaments. There is laters of tobusheer in the bunder and an

opal and the persons color and the man per of light reflection are much the same Roger atr. bee stil made, not with elect weeks uptracks of trak, postured, and section other free. These univers are embedded branchs the retain of the late their position when the tree was young and fine wat on, have become strawed by the growing of other seek things to hopen in the life trees for not only some but places of less and other metals have been front. The stones under considerathen, become, are produced by the tree itself and and riskely shaller in their formation to pearls. These repetable pearls are about #titledy carbonate of line-



Executed parts of the carthinductor company for sireless A Versatile Pile Driver

The weight at the baller on the one etc. of the trace congressioners the weight of the pile two on the other end Sanctines tiles have to be driven with a hotter receives play land to be driven with a haller, instead of similate, or plants. To provide for this is hallering arrangement which affects hitse positions is held into the ris. On test builting at an expension change have it could be noted that it is to be the period for owing to bridges and other observations. In our life tration, pute that there is a pivol at the upper right and owner of the trues which carries the pile drive This permits the whole pile driver is he henced on the the truck, which has to be quite long to effect were to men it the whole for to bride to. as postly as a cheel projects. Incidentally, the lens

track has the advantage that it distributes the weight of the outfli over a larger area of track than would be the case if it were as short on the average retirent crean. Nachinery of this sort is usually headed with beary holds of box loss, as that it is necessary to dder mark lugde. This pile driver may be changed into a first operation beautr data becomestive cruste very really, and in a relatrum of tiers, it having been designed with each on constrainty in view.



Putting Heat in the Bank

Thermal Critical Points, and Their Relation to the Heat Treatment of Steel By Arthur L. Collins

been heated to its neiting or its helling point, additional heat new be supplied to bring always the change from the wild to the liquid on from the liquid to the gas; and that while tide charge of state is then being affected no class in insugeration covers there passage from the one condition to the other in values the doing of creticin work, which in corn corum the absorption of an anneant of heat that Is surprivingly For Instance, in converting for to steam, eligibil then seven floor as much heat to consumed in bringing about the origal melting and vaporization or is heating the water through the perspections interval

for liberate the same anought of heat that is absorbed Most of an Annexus do not know that in addition to the native and belits; points, many saledness possess other 'thermal critical points,' at which increase of they is temporarily suspended while any heat appoint goes to work to effect a chains of more not in the readition of the naturals. The entire practice of host treatment of sized in based uses these critical points and the changes which they being with them. with a piece of, may, take per cost straight-curion to an electric furnace, in sent a way as to record the temperature of the steel itself. The temperature will be seen to increase at a rate approximately uniform

between 1300 and 1400 degree (Fabrantell, as fixed: but som cetted beeting is resumed, un tures 1400 and 1400 degreen, where returdation cream of transcriber

steel from the furnace and allow it to cool materially, this will our se down to a pute between 1260 and 1880 period hout to od without actual cooling - indeed, the ally rise recognization offer a second history ture between 1270 and 2000 degrees; below this ing is unignerrupted to best absorbed to

acce transferration, or yet undefined, during heating, is given off against the transferration is reviewed during moints stille the mriting-freezing and the aspertunispece wifee mants, the critical temperatures going up and manice punts, the critical temperatures going up and ming down are not identical. That this experiment on charted with intervals of time as also one and asperators in degrees as reditates, associating like to above graph would have been obtained. The critical points not in brailing are known as es of devalvarence (detacted as Ar culates those of ending as points of reculeweise intracted as Ar points) office a resistance to charge, which mive the decale-egars point and issuers the other. The source should besting and coultry take place, the less is this name sace, and the less the displacement of the refrequent-ing critical temperatures from a point, theoretically to be use in infinitely siew heating and notifier, when they would be identical. Conversely, the spread he they would be identical. every and receiverers may be wishood

by very raphi heating and cooling. Indeed, by severe quebeling the reminenter paint may be so levered that the metal has thus to become rigid before the Introduction can over, this preventing it from taking place at all.

Audit, there is a "investing traperature," higher than the become critical paint. If cooling is begun at various temperatures below this, no variation in effect is induced. For if the specific leaved above the lowering transcribers, it turns out that the hatter we get it

ing impetation, it turns out that the latest we put a before we sure, the cooling, the lower still owns the recollectors points. Extending the time at least has the same result. For obtains reasons to unalogue phebenefits is to be sen with the decalescent points in curies content also has a hore influence on the critical public of the various strets. In fact, up to 0.55 per cent curben there are three traped-regulate; It is employed that the two apper care coaleses as the curion content is increased, while the lower one re-

gradually, so that if quesched at an appropriate p

the iron. It is extremely hard, and about two-this on insuperic no pure iron. It usually tends to be up into Iron and certice, in the forms of ferrite a so this line and sories, in the forms of ferrits and symples. Parette is a continuation rate deserved; of smeattles and feetles, seasily assesting about this join of the continuation of the continuation of the con-plementum to the meaningship of contently, in line that is parety bett, giving brainess, and purity salks, or in the continuation of the contently of the stage (which exists above the higher transferration) point, and the first transferration of the con-pletis, and the first transferration of the con-pletis, and the first transferration of the con-lection, as the size is counted at all livery two contents, as the size is counted at all livery two values of any livery in the content of the con-tent of the content of the content of the co-tent of the content of the content of the co-tent of the content of the content of the co-tent of the content of the collection of the co-tent of the collection of the collection of the co-tent of the collection of th

> instance, partly austra-life and partly married cooling is charged the resulting conditions are different, running

Steel containing 640 Steel containing 6.00 per cent of carbon—the meant iron will discover under ordinary conditions—in known as expected steel. The statement is sometime sittle to harden steel of less than outertid pro-portions. If one means complete hardening this is correct; but evan with

and the halling parets, meny saturances passess other thermal critical paints, of which increase of temperature is superiord while any last supplied gass to work to effect some physical change in the material. It is in fact at these critical points and by such absorption of loset that hardwards and known of materials and of loset that hardwards and known of materials. of text that hardening and temporing of metals are control one; so that in e very rood sense, an sear title augment, the heat supplied while the metal remains of the critical temporature in "not in the heat," the drawn sed in the form of imported metallurgical prop-aries. Mr. Collins was before as the story of just have all this taylor place.—"That Epstron.

> a standard diagram Auces rhart, the newter and approximate b nient our be obtained ly simple inspection It is not differed to unferriged in a property may what happens at the critical points. Alberupy in the especity to sedimen, without

AFTER a material has been located to its molting point, additional heat must be supplied to bring about the actual molting. While this change

of state is being effected, no rise in temperature occurs; for the passage from the one state to the other envalves the doing of cortain work, which in turn

means the absorption of heat, is an amount often surprisingly large. The same state of affairs exists again at the beiling point; and indeed, so peach is familier to all of us. Must of us, however, do not know that in addition to the melting

change of chemical con-pection, an interaction of cheutral and physica recognition. The occurmore of pure curious as district to the care Graph showing the behavior of steel under heating and graphite is an example. The explanation is decicion to be aught (see Scientists Assistant, May 15, 122): The ambiliother of the filter, and May 28, Dist

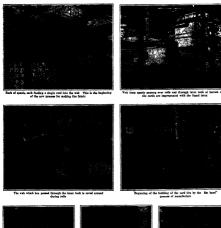
The decidentary of the Mobinson) is a rearrange 1233. The deviate date of the Ridovich' is a maximum-ment of the electrons about the reviews of the selec-line, too, exists in all entire collecting the force; and possing from one of these to assister is morbid by possing from one of these to assister is morbid by real points we have noted. The three forces are eleganded elegan, bear and graving former and eleganded elegan, bear and graving former. It is seef, duction and support, it will not denoise carbon. Belo-line, which has no lesier some than this, is of higher-spectic gravity than the ferrite, we hand, fished using notic, and to a limited extent copality of absorbing cortion. Gazzen loop, or analysis, is of still higher worth gravity, mu-magnetic, wither thus been been been bander thus states, and shorthe curton. It utilizes to the three simple ferris, several others street as here. Conventile is carbide of loss, Fact.

mercining 45 per cent carbon to chemical an

guenching from personnes not use upper reconnective paint given not insulie and is partial hardening in effected by the lit seems perhatis that hardening in effected by the restriction of the loves in the beta condition, after a ten-perature has been reached in cooling at which transpersonne has been rescaled in closely at which treat-formation not of this state would redinarily have taken pitter. The pressure of curious increases the assenti of lets iron which thus resists transferoution. So the note carries the succe beta from und the greater deg of kurdness-until the extented ratio is rearbed when, under preser conditions, the entire body of m passes from the gamesa to the beta form and is held in the latter form by quenching.

In strein of low curious content--0.00 per cont and less-there are three wholly distinct critical points less—there are three wholly distinct critical points the mean tages one being represented by two transformations which we may have call upper and middle As the metal couch to the highest of these, the refusely exceptable is superseded by a saddest expansion, to have a graph by omittaction after the critical isospeniates in passed. Electric conductivity, low at high two-time is passed. Electric conductivity, low at high twotice is passed. Shortic conductivity, for at high temperature, foremeas eather the transformation and continues to go up and representant formation and continues to go up and representant. Also will be upor critical attacked to temperature also will be upor critical and results of the continue and the continue and the continue attacked and a decrease in the proper of absorbing outless. The attacked change is from the said facilities of examination to a district of automation and decisions of examining to the facilities of automation and decisions of examining the automation and an action of the continues and actions of examining the automation and actions of examining the automation and action of examining the action of the continues and action of examining the action of the continues and action of examining the action of the continues and action of examining the action of the continues and action of the continues are action of the continues and action of the continues and action of the continues and action of the continues are action of the continues and action of the continues are action of the continues and action of the continues and action of the continues are action of the continues and action of the continues are action of the continues and action of the continues are action of the continues and action of the continues are action of the continues and action of the continues are action of the continues are action of the continues and action of the continues are action of the continues and action of the continues are action of the continues and action of the continues are action of the continues are action of the continues and action of the continues are action of the continues and action of the continues are action of the continues and action of the continue

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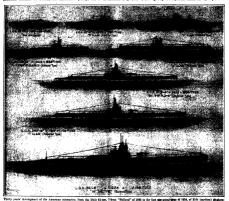
Development of the American Submarine

From the 64-Ton "Holland" of 1895 to the Sea-Going Submersibles of Today

which read be given to Anorther other the spine or to part, needing piece install be given to the estimable. In deviding too the belong, it has been one perform that belong, it has been one perform lim, the investor who has produced the fine only lim, the investor who has produced the fine often that wellow that no related the fine often of the fine collect that no related to investigate of the fine.

the problem and endemuned to work if not in mean practically, usuals form. The section attract at such author investigation in the little Context, and Outfar the saccording 200 years such use as farmers, Prof. pp. 800, and years such use as farmers, Prof. pp. 800, and years such use as farmers, Prof. pp. 800, and years such use as farmers in the little period of the little prof. pp. 800, and the little period in the little pe

carries is contact to the development of the American subsearing, precipital reservities a posting acordion of the work force during the next 17 years by Invalide of motion subsoulty. Notice issuing these any the "Studential" journal-time noticerate; the "Defect" based state the hermone and others by surrage betools, and other configuration (Procch Senighert Wilwarded consequences and with the Lanceston Followarder configuration work, or even to the wellabler the tables all-downwally stated of worker and accretion of the configuration of the control of the contaction and the configuration of the control of the contaction and the control of the contaction and the control of the contaction of the control of the contaction of the contactio



Thirty years' development of the American extension, from the Bulle Solom, "Solom" "Solom" of 1995 to the fast ano-going type of 1994, of 1164 (surface) deploy ment and 25% knots speed

American travels who has given because in a special order of without an wide to 20 mes par has been the gattern travel with the wides multivation. The distrations of the real Line been marked The State of the Control of the Control

you her near the experience of Felius, of since, the first, we have first, who supposed his "Statistical" a selectative of specialistic spice size, with, his Badeoff, and the selectation of the selectati

duction we quest the following from the T. S. News, Applications of the Conference o

n at the surface and by electric mater as ethicognic.

In Likes fields to get his design conquied but it do 1939 he built as tout, it deset by 5 four, of theher I perioded it with coards driven whosels and enhanting by which on synhonyling it could travel on the nating by which on synhonyling it could travel on the nating the which was a hyposil intersignant and heatfactle Ancedenn inventey. Down through the rate of the state of t

billt anany of his typs the the U. S. Navy as west as fee colore countries.

Mr. Heikard's drat effect tooks shape in the denome 'Reddan' Nr. 12' built in the pare 18th, and for a period of several years Holland kept pending own; at the problem until his designs were finally approval and in 1860 the level of a busy was laid which was and in 1860 the level of a base was hid which was learnched and known as the "Pringage." The first of our drawings shown use of the effects of into early period. It was 10 feet 3 into level and displaced 64 thm at the surface. The "Pringage." So feet in length, bod a mathematical displace of 11% feet and a santire displacement of 180 teas. The beat, as first designed, was unichabitable however of high nesseen and for severel years the completion of the Meanwitte the Heliand

and built at he own expense the was longer then the one berevith shown and was of It was driven by a gravitos engine of 50 horas-priver on the surface and he an electric meter fed by ried a bow torquelo tube and made arrest leasts on the sur face and \$1% knots when schmerged. After enlarge States authorities untherines her purchase for \$150,000.

Some ten years later there was built for our Navy what is known as the "II" Class. in which the length had gone up to \$2 feet 5 Inches and the surface displayment to 145 tons. The speed was along time knots on the surfore and seem knots sub-merged. The cruising redies was 100 miles and son carried ten officers and non.
Two years later come "C" Class, penerally sheller to the "H" Class but larger. with an overall length 100 feer 3 inches and a sur-face displacement of 240 The redict was in Consed to 100 coller the izel was the sette, but an additional terpedo take

one and the "C Class (we taken.
In 1909 appeared the first of the "D" and "E" Classes,
the length of the "D" Class being 185 feet 3 indies the length of the "D" Class being 135 feet 3 incises and the displacement 280 tens, while in the larger boats of the "B" Class the displacement rose to SSS lens. The "D" boats were good for a cruiding matter of 1200 miles and the "B" boats outld croke the about 1700 miles. The respective speeds at the surface and subserged of the "\$0" bears were 15 knots and 3.5 knots. They carried filmen after- and surface.

ofs. They carried fifteen afficers and non and were ad with two torpeds tubes. In the next class selected for illustration, the "H" In the agest class selected for illustration, the "H" Class, the length was 100 feet of inches and the surface leptocentor was 685 tons. These rescein tracked matchenible adoline in carry particular. They were spable of cruthing swerpl thousand sales at eleven acce, and they had a speed of fourteen havie as the strikes and 100 functs sulpassignd. They carried a ect, soft they had a speed of fourteen knote at the trace and 10.5 knote submapped. They carried a sew of 28 and were presided with flour tempode tables. In 2005 was designed the famous close known as the 1° bests. These, which the thirty producessors are of the general Holland type, are 216 free 3 inches in legislated and about 85d tent displacement. The

res afrem eggly to a large number of boats num-ed 18 to 41. Their motors are of 1990 homeower eardon terred at fifteen hands, and they have a of twisterney of eigent facts. They are condition in a recites of about 1990 miles at eleven, knots.

ment is 37 officers and men. The date of the dasign is 1913. tion. The next or "I" Class designed in 1915 are to ats. The length owned in 200 feet and the egg in 1700 tens at the surface and 1700 tens larger beats. Ther are chelical with a maximum area of nearly knots on the author and estemped they

7,000 to 2000 miles. The last hand shown in our drawings brings us up to be product date. There are those massic of this type after construction. They are of the "Security" or "feet" type and are of articlest size, power, queed the project date. under employethen. and radio of action to acrossyony the fact at the high ever and engage in a first-closs buffleship engagement They are known as the "k" (hoss. "T-1" was launched but sugger and will shortly be to commission letath has risen to \$41 feet 6 taches and the surface diplacement is 2004 tets. There froe beats were de-signate by the Borest of Orstragion and Repair of the Nary. They embedy the most up-to-date practice both in construction and equipment; but for the present the Payrous down not which to give out any detailed description. They are driven by all another and an expected to show a speed of about 22.5 knots on the merfore and any knots subserved. They are moved the

honer minurities built or perfectal, and it is be

grains of the same coved, ready to precisate, it will be found, that the previously grains have a consider-aity higher temperature than the dry. Must more precise measurements may be made with the of the needles is inserted in the times of the plant

while the other is exposed to the air temperature. With ters may be assertedned within the three-chap

mandith part of one degree.

The development of limit in plants is believed to be due to the accumulation and digestion of reserve ma riol, principally starch, which, in the presence of case max principally starts, which, in the presence of star-buse is introduced this segar. In many betauco, marked differences between the temperature of plant tissue and that of the surrounding air may be attrib-uled to the fast that under the influence of smilght the plant tissue is build from the empiric. The truths of trees, for income, become gradually heated d the day and, being surrounded by back which is a good best-insolator, they retain the heat grach longer than the out-life sir, the temperature of which quickly Differences of nanderably travers evening. rectify or note digress have frequently been observed seen the temperature in the investor of ten trunks and that of the convending air. The paser temperature of plants is principally re-

selectric gordles expanted with a gatest

ford to two capes, the reading effect of the evapora-tion of moisture through the of boot by the underground Not all mores of the some plant have the same beape rien: Measurements taken to the least over all a little showed that the temperatur neur the ground was slightly honer than in the middle of the store recognitive blished

in the upper built and rising tearlieds pear the tep we please after develop higher than that of the samrecoding air in their biosthis difference often read 20 destres in Area and other system photes from 2 to 15 degrees. The bismosts of the Itelian Artes, which ours toward routing, the the highest transcrature at midnight. Then the tresper-

mer, prochite potteti so ofter words It is relieved that the rise d'insuperature in fance increasity of expensions the during the viewer



Fire typical applications of an all-around electric motor for the household developed in Germany

liesed that its three vessels' see shall be recreited with acapting substantian fully equal to the articols duties which must be executely full to each beat. After they have proved themselves, It is to be larged that Congress will make liberal accomplations for of an many as the General Board of the Naty Per

Temperature Variations in Plants RECENT investigation have employed the fun that, commy to proceed belief, the temperature of place is not always the same on that of the sur-rending medicar and that different parts of the same plant may have different temperature. As a rule, the temperature variations are so small that it is difficult to determine them with the thermometers consocial in use the measuring temperature. Finity good results may be minimed what maintaines of operants of one de-press. The small said printed cylindrical bulb of the hi-streament is corefully pushed but the these of minime.

orth a flattered bulb is used to measure surface ten-In sent case is differential thermometer is as which has two bulbs, puch excluded in a thin-realist container. If one of the containers, for instance, is led with dry grains of some certail, the other with An Electrical Jack-of-All-Trades

NERMANY, the land of specialization, is rather un C accountably requisite for use of the months allnumified electric friend of the family" Itrenek inenting rectific friend of the partity" (fritishill) literally its imp-winded Green's trade notes). His trained on this page. The little electric notice while fection the chief part of the outfit is mention on a beri-mental shadt. If we receive the motor from this shadt and server a drill to the herrol that truzessits the rute than of the notice, we get the handy little drill of the hover right-hand view, which is easily manipulated in any position. Very little tandification from the dell meters remain in an obeside source-driver. If we record the drill and classes the motor to the table, we open up a whole chapter of applications, according to what sunitary indrases is coupled on the motor. Arming the expectage illustrated are those as a latter and as a circular saw; and an laberwing varient on the latter application is bewilling. Suggestions which our Gen-man contributor makes without phetographic surport the temperature is to be severalised. As fractioned the use of the motor with filter and polishing Shouthy with the raw of a tittle tetermollars peer which, we holge, comes with the motor, this some of power any be coupled up to chapping tells, cisters and a wide variety of soull innoclassic mortizes. For household use as well as prosent stop applications this

seems a very well-worked-up meetalty



The mush going through the cooling colls



Filter presses, pressing the years

Microscopic Vegetable Growing The Curious, Factory-Adapted Agricultural Processes of Yeast Manufacture By Ralph Howard

that comes and wrapped in Highel, and that our mothers, when broad was baked at heave, need to use in becoming bread? What power is settined in this mass that makes it possible for it to convert a moon mass of death into a light, employ produc which is afterwords below to give a paintable, easily dipositio, fool product, the leaf of bread, which has apily epough been called, the staff of 1867 in it a al that is consumed in this weaterful substance cherical that is consided in this wonderful subscurer: Does it obtain its protest from its chemical properties? Or what other agreey is hidden therein that is respecials for the effects that it produces in the kitches

It is probable that it has never occurred to the secure proved who trees yound or who has come in contact with it in one way or another that here is no mere changest no facet. Officers muss, but a multitude of licing cells. Your is living matter. It is composed of myricals of intercomparations, year cells as they are celled, which are allow with energy and which reads to come their energy as smeld corners, medal to man, when placed in the proper conditions. It is truly one of the paint ingresions of modern actions ments that It has been provided for much to become the energy processed by nices-works, living matter and per it to trustee certain, insecting results for him. Your is a vegetable of the funges type.

It grows by a process of hudding. fediations only of the year plant are percinately 1/3900th of en turn. In one weed of year there are billions much billions of these plants present tightly to-In a three-cent color of seed, for exittely. It has been estimated that there ery 22 times as marry years relie as then are people to the sealor week The ment receiver most of the west rell greats to the manner in which a Helf other relle until quite a cluster has fremed, a stanting process sets (b). results in the group gradually breaking

up into inchiabal cells.
The manufacture of the cake of comground year to by the torsion a skeple The process of mobile years mendets everytially in rains one the pipe. In other needs, must britte a vicatorie, is great and in country the soul tions pass he way corrisily regulated, just us in the

In spreigs any photothery are certain elementary rendenties which tree le vocited in onier to shisin a prime greath of the plant obtain a prime grants of the pixel. Thus the seeds from which the pixel grants were be excelled, polerted so that a strong, healthy growth is obtained. Further-grey, the self or rather the find tredit on which the plant grows should be such that it thats the peoper on the ideal erests and decharmen Pleatte .

the conditions under which it is great, such as the in the regular pointed and then is purped into the sourtemperature, the light, measurer supply, must all he so arranged that sufficient of each is present. Dafer such ing rule.

Toust has been fromt to proor best in an arid trivinged that sufficient of each is powerd. Under such retrisuotations a prime-primarile plant is obtained.

Hence, it accordance with the manner in which the gouring process is controlled different surficies of power are obtained, much in the same suggest as different types of cabbages, polaries and other vegeuniversit types to extending specimen and controverse tables are obtained by tentilize the conditions under which they are cultivated. Some of these years are satisfied for univing Benefit, and some are not, but our be employed for other purposes.

et is not grown in sell, as are other please, but in a medium which is made from grain grown in sell and which is excelled controlled and composed so that It contains the proper field ligarithmic that are re-carious by the plant. Thus the field most contains abrongment native, formentable arguest and inferen-menture, such as withs of princetors, magnetics, col-cious, loss, phosphorus and saider. Gorn, seek, pp. cion, less, phosphorus and solder. Gots, mak, ty-and suck spreads stopply the Sud material in which

Each of these raw materials with the exception of the sprouts in first exhibited in a riseably operation and then they are greated in mills. The own enck is control with water, which has fire been filtered, while species are just molad and wen to the man tol. ben the ground betiev mail, the ground ree, the cooked

I must has been found to prove best in an add medium. The increasing smiller for the growth of the yeast plant is obtained in the souring tab by the addi-tion of amother egganism which gives rise to a large acid feromateriam. This expendium is known as the largic acid harding. The most in the souring tob is soured by the greeth of this builties. This has also the effect of purifying the mask and entracting valu-able field numberial from the grein. At the end of the field numerial from the grein. At the end of After being filtered, the grain extract which on all the guirittee matter is sent to the large ever fernementation take. Up to this point the process has been encourand with the preparation of the flood rection in which the years is to greet. The first step

It the fermentation can be to said a new column of press. Then air is tolera through to supply the mores sary amount of cappen and the years in allered to grow for about 18 hours. Then the greater part of the figured in separated by means of organization separates and the great is reserved from the residue to dry peresting in multiple plate filter presses. The next step

providing in multiple paters filter powers. The next step in the passesse its ract; it is on as to insper guideoutly and it is there end this powers for clutters. During the entire operation the greatest of core great be taken to control all the various factors to determine the quality of the facilities product, and manufact are taken at reg-sister forecasts. siar internals during the powers for the manufacturing powers, which will pe-suit in the obtaining of a year of high quality, in absolute electricess.

quality, is also the clearlines.
The interesting point alway the fer-securities process it which the year is grown is the names of this growth. A single posst plant decling in a proper food unders will alway a white projecting on medium will alway a white projecting on medium will show a winter properties on one side other a period of 20 minutes to helf on hom. This projection or had ethingse and swe is nearly or large on the original cell. Then this had puts out

wase single second singly.

Present year is a frishle mass, containing about 10 per cent of solids of variable expression and showly fee to ten per cent ask, feed being years has a pleasant tame and other, and to nother wat are crassley. Years contain provise matter, market cell which is tool for the brain, phosphora, which is note that feed.

make an early for the needs and home, graces is never too.

existing such for the section of the blood. It emitted enterprise and vittacine.

The principal use of years is as a beavening agent that is, it is employed to raise the dough from which



the much tab together with additional was The much tube are huge concer tube which are ken After the rest is notice, a pear

speciesly rises. After the rees is existe, a process which has for its porty-se for repurship of the stands probable on that they can be seted upon the first district, entitled in the mail, the cent is dropped from the much title. Then the cheant general mail to called and the similar he keys at the proper content and all the similar he keys to the proper contents that search by the districts. Most space is obtained in 8th The other grains are then askled, and the whole a

speciencis riesa

terd organ milk, sait, fo t to move the water transfer the property of the first transfer to the property of the make expedient to some diposition. The make expedient to ford, improves the favor of the break and allow a partition. The latel improves the keeping qualities. yeast food, large to its patrition.

or me symmetre. The most approve are title of the bread makes a post relevely crus the bread moter. Sugar aventure it, exposer to raise the dough, gives the coder to the crust, is a food for years and adds fived relate. Milk improves the perce past in reach the design, given the color in the crast, in a food for yeast and adds fixed value. Milk improves the favor, acts as a shortening and gives for value. But; recards fertuentation, adds to the flavor, develops bread odor and dees the glates. Serv are five functions of the re

There are five functions of the yeast in bread. First it serves to rules the drough, then it entirely the glutter, the respect to the first transfer, and to surprising and supplies the varieties. The leavesting action of yeast is due to the outless that it has no super, country the free-selfation or decomposition of the latter with the contract of the first production of the latter with the contract of the latter with the contract of the latter with the contract of the latter with the latt to accord user it has on angar, entering the formediation or decomposition of the inter with the avolution of curion loade gas. The effort of this gas to coupe from the gitteneous dough cusion be leaf to expand until it becomes light

and preces.

Hat he addition to this function, yeard also possesses another which may be said to be of even more importance, and that is, its action in metaring the plates. reducing the bread more dignetible, whole-some and nutritions. How is this efferted?

Test contains a case of substance that are known as engines. These engines being about certain closes leaf chatgies, their mere presence guiding and con-ceding the action of the dough. troiting the action of the dough.

There are four important engines in year. The
first is makine which presents the power of converting mait super into a directly frementable, simple super-ginetee. The second is invertices which converts best or once super in the dough into glucose. The third is syrmate, which is the outques that stitudes the simple sugar, glucose, and converts it into certain dioxide and skettel. The fearth is a group of empress known as across. The sures is a group of engaged convenience protection. Which possess the power of setting on the priving found in the detach, resulting in the melicating ripeding and meruping of the glutes in four. The new offert is a broad which is easily dignostible and assistant offert is a broad which is easily dignostible and assistant of the control of the control

lable by the homeo system give fine to these difficult, unconstraints and distress tion by the furnish system.

Tend therefore put only learness the hernel, sinks a light leaf, but it also partially dignets the gloten in it so that a part of the work that has to be done by so that a part of the work that has to be once by the digestive system is performed before the hered in outer. It also adds tratifies value to the bread day to the giproper that it cuttains and is also a super-of viterals H, which is an important conditions of fred, as its absence from it gives rise to meinsprision, general delitity, loss of appetite and makes the individual easily susceptible to the invesion of discu-

Tout in also the source of many medical preparation of importance. Other among these to your mories will This selectate is used for the purpose of increase the the number of white blood commerces in the bear if One of the most important recent developments in One of the most important recent developments in the use of year in the baking of brend in known as the andough-time process. By this powers, in which 25 to 5 per cost of your is roughly of hand on the weight is injected subcutationally. The people is treated with already and withtings of suit in order to believe this to a per cost of your is required master in the weight of four word, the would like ulletted to the frements than of the death is coulded. The founds goes directly If her also been freed that went personer the person

dough in earth of sit at a higher temperature in this traces and the trace for its above resistanted at a higher temperature than in the old process in which a certain amount of their was set aside for ferments than The result in a time level of appeting favor, retailing its freshmen for a begree period of their and requiring from one and one-half to two hours for the

leave, each as some bells, carboneles and the life

It is also used the the treatment of cases

ti elimente.

erty of contitoing with lowir dyestells; that he the yeart protein does. Then travitoral with superheated steam at a temperature of E5 degrees Configurate fixes the dec. The result is a series of useful preparation the dge. The result is a series of useful preparations with such authoritie deposition, or methyl short manusches, and aufentions. The conditation of years presents with parelyl whele yields the predox known as graduants, which has been teed in the pre-series total baking process in place of from the to whom henry and treatment of the foot-god-month distance in cuttle An actingual preparation is obtained with sound and

at programation is obtained with worst and familit, as well are not and ethnison. Section forms of years have been sep-nered for use in the extraction of their fieldy content. Young for this purpose is criticated in a food medium of motions supplemented with matriest scale. The reventing press cake contains 18 per cent fut, ill per cent proteins and 45 per cent curlulardrates. The oil is editie; the burdcarbajedana. The oil is odific; the hard-need predert may be used on any other. By treating wants years with formable-jude a labelit-like predert can be ob-tained. The predert is dried and ground with str., solidly or playments. Then it is another into shape at 160 degrees. Centi-grade and 1000 pounds pressure. Pred-ous recentions raises and include na-

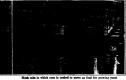
choised from year, fremiblelye and glas. However, by for the gowster quan-tity of year gredword is employed in baking, and more recently for first con-munition, to examine it is effects of vertices with discuss and infertions. The inductial uses of year are important mainly in that they provide a tasks for petring pid of hypograde reast

While the use of yeast in the building of bread florest use of the largest applications to which this product is put, nevertheless, there are other uses for yeast or Two Pecks of Sugar from One Bushel of Corn A SUMBLE of own weights about sixty possels, and A about Hidty-three of these possels are acceptable for by starch. It is not difficult to extract the starch well. A recent development has been in the new of your for the expensive purposes. Many scientific invest-gations have been made along these lines and very interesting results have been obtained. It has been has beig been sought. Man asked over that your powers valuable properties as a dictment or therapeutic agent in the treatment of adulter of his etemach first. That expen is an old head at changing starch into super, her man has not until very reveally found the secret. New comes the an-nouncement that H. C. Sore, of the United States ipacker. It is not a drug and is not in any way used of habit-forming souseries. It can be used is university that B. C. 600c, of the United Naths Burson of Chrudery, a schildlary of the Deportment of Agriculture, has found a way to get thirty-three pounds of super free, each bushe of rem. Mr. Gere is cheered in charge of the Burson of Cheutery's species in treating various gostro-intestinal Another one of its uses in the treatment of skill Fruit and Venetable Dilibation Laboratory

The lateral use of year aways to have a market effect in presenting the conditions in the system which The reason white grasshood green's sugar menty all sai is, technically specials, only one of the The fred chemist cuits it success of general defailty, melastrities, loss of appetin, and the like. The bracketal action of the year in the reven is due to its centers of vizzain R, for to the lock of this villustic is generally as-ribed the preto sooner there are the well-known from of sweet enes, glurier and malter. These are also sugare, but they are not successes. Maltree, the product which is to be need from corts, is somewhat succept than gip alone of such conditions. Another interesting arei-lest use of yeast is in the constant of risensally res-ditions. It is claimed that good results were secured by the administration of years one. Let only alest three-liftle as sweet as surrow ends, the proces consists of mixing the constant ath warm states and sail and then patiting is through the other physics which critical "Mager" goes the earn wave and unit and the printing it from the earn processes which criticaly "sugar" a through, The new sugar leads a little like confection sugar and testes like Christens conds.

Nr. Gene, the discoverer of the new process, states make my less dependent on ferreinn countries for our segar semply and at the same time will, when devel-sped inductionly, furnish another outlet for the corn grown in this country.







The Story of Steel-X Rolling Steel Shapes for Buildings and Bridges

nement leftling are the ferms of our stration which are progriped, the latter as basing originated and been deceloped ertida substadita durarteristes ultid have copied it to be recognized on a distillutionic Particularly of heidp- heideling, may If he soid, that it is to the improved methods of manu-facture and shop contemporary that the reposits and loss cet of contraction and credist of American Indiana was due dentig the greatest era in the bloomy of bridge constructed in America. So also us that seeminiby Assertion structure, the sheaten street legislate, we have theologic, under the urge of mesonic, is type which is distinctively one was said high fair in these of the world as are obliged in geographical stid other resultings to noise a large working resolution steel a limited area of ground.

building, above referred to, has passed and the press ing recombles, at least for bridges of the larger type have been used, the hold office leathing and the far spreading and many-storied factory is grow at an ener increasing

To meet that greeth their his last a correspond of the shape which turn out that kind of steel hullding nativeled which is known by the practic mane of "chapes," under which are included applications, T-leans, Deure, Zier, chunne irens, etc. It should be noted that it is rectionary to speak of "bests" and whaper the former including ell beaux, stigles, etc. one leg or web or inches and over and a thirty

ness of agreementer by hamil Heavy plate girder for main line of New York Control near Depew, N 121 feet 6 inches long, 12 feet 5 inches high, and weighs 130 tens. The rietter to any complete bridge manufacturing plant will be taken first to the work pard in which the new nationals are assembled made for the open-learly factors. Here he will find less one, strapped steel such as junk, one cask, publisher and practil some free the emparaction and number slave. Also in note

structura or teatments; year-power; the "light" shape and sourth angles being such as are polical for the nonenfacture of hobotoxic, nari-rightmal languagements, fotors, or for other friendum. readily be understood that an elect of the grouph of the to large figures. In 1914 the bend output was \$24 fees. For to the interior of the next, the head works he will find a considerable stock of pig from in the stock yard. In other works, and those the most year in 1905 or \$,009,964 team. It dropped to 1901 to more, the pig for the open-levelth farmers will be

1922-RNA last in 2028, After a presurfacible 2524; lest in 1925, other a researchildy rapid in re, structural slupes showed an output of 1,640,155 tots, the grunteet in the biever of this industry less to my that practically the whole of this soterial was rulled from steel, 1448 tens only being reind yes one. In its head estition the productive of "sluges" in Island to that of any other collected product. The

stord is topped from the furner to the possing halfs cost into higher and, after the leaving in the seaking pits, is relied down into blooms, billets and the per-ticular finished shapes desired. The shapes, plates siction finished phages desired. The shapes, plates are for letters were not relied settleds from legiopen-hearth even, three grades being produced, manufit, "tied," "well" and "swilling," Eller view has an ulti-mate strength of from \$5,000 to \$0,000 periods; soft from 2,000 to 52,000 pounds, modium need retail and trust be expable of being best over on then to an engle of alone 180 degrees without frecture (if late years ledge engineers have less it for special grades of alloy seed, particularly for epoless, and in this one the ultimate strength will net on from plant MOSEO metals to 100,000 metals

world direct from the blest form is run in, a certain properties of cold stray, etc., have less planed in the optioners's further and the work of refining is carried on as described in Chapter YL, of the Russy of Study Symposium Authorary of June. The blooms and sinks from which the shares are

miled are themselves rolled down to size from lights of salishin size. An 8 by 8 linth bloom will be rolled from an impet about 20 theless square and a size of soy. His by 4% inches, will be rolled done from a 23 by 19-inch ings. Generally, the inguts are called own into bloom in aille of the revening type. The inger, raised to the desired reling heat it southts pits. ingo, raised to the desired relating tent its assisting fair, puesses between the rulls, is revelved at the resur slot, and, the rolls being their reversed, the ingot makes a return pues. What are known as pick-up fingers series to furth the linguit over through 80 degrees if on desired. between certain power. After the light has been because down by any, from a down to fifteen passes. to a bloom of the required size, the bloom is transferred to a steam where it is not just the irgain desired for

rolling late the particular shape required.

The rolling of the shapes is frequently done on a conthe swell employed to request to the extraction of rolls.

shed one-half of the steel is rolled from the input to the fusibled shape without any interested in results. The guide nalls meanly have six stands of rolls arranged con-secutively in train. As a rale, the recalifies and seed finishing in their to see of three-high rolls while the etter in dien between mo-big relia After having motes that the production of angles, I-begge

changers, etc., in done passing the superial betw ground rolls, it will suff direct the reader's site to the two haver eager showing the relling of a and I-bears. In the

es, the opening between the rolls is large, but her each increases power the rolls are brought closer to until in the final pass the coming or specture he term in the main pass the opening or specture is exact cross-sectional struct (by Ripides) steeps. After the sloopes have passed through the dir mill, they are thrushermed by roller tables and in to obscular saws which cut then to the desired is arty to the rails, the shapes, as the



action to the straightening press describ-in our chapter on the unstalecture of siz rells (see Scianciste Assession, Se ber, 1904, page 175).

The art of bridge construction or far as shop fallefeating in ou in beliding up large and namely use out of a szeitlissie of rejutiesis out of a statistisso of relativity should askepes as they are assembled in the stock yards of the leidge works. In the receiving yards at the Gary Bridge Works which is 280 feet in width and 800 feet in leight there lets been assembled, at times, in the way of plates, lars, angles, I-beaus, etc., as high as 41,000 time of material. Since in bridge beliding the weights run to high figures, it can be understood that the con-struction slope are so hild out as to year der the operations as continuous as pos-sible with a cultivizat of headility and

The first operation is to lay out the work by means of wooden templates in which the exact medium of every stort. angle, greet, etc., is marked. As a real-ter of fact, the building up of the bridge material into these bugs posts and ten-sion members which look so swe-insulring in a lage cutifiever or suspension letter, is a strate one, the chief regulate being is a striple one, the clair recyclicle bring. Strict core and accuracy. The plates and strapes are areas or descred to exact insurant and, where 2 is collect for, the sides and make are planed and fored dwar. Holes for the integer piles are first purched and then breef to early discontaine; but the entail holes for

being and rives are provided by means of highly devel-oped ancelpray driven by electric power. It should be utlesed, beaver, that there is a tendency to abelie the conclude of river bales, because of the undertrable stress set up in the adjutating majorial, and substite everywhere straight drilling. The punching and drilling being completed, the sep-

perior passes are assessment and source capeting, care, being taken that the river looks are properly registered, reaufing being reserved to. If mercentry. The work is then rivered up by hydraulic and pre-matte rivet In the Gare leidge shops are assembled were of the th the thirty resign knops are assessment with the thirty and plant between the control of the c ing merbines to be fread surrelety in the world and one of our like-trailous shows a Southfule drifting ass chine of the postry type at work upon a large place girder. The drifts A. E. C. it are corried on radial error which are apported up a tourserver

girder E which can be useed to and f over the full length of the work which is being drilled. This transverse gloder by etterhed at the ends to the two legs of the skilling posity which travel on tracks resting parellel with the work. Inci-dentally, this picture thustrates admirably the way in which the places, angles, etc., are assembled and rivered up to form a phote sirder beings. Thus, against the gastry legs are seen the upper and lower chards O. O. of the bridge, and early chang, at its crater name the stress in steet, in built up of five expertraposed places. Hetweet these chards is the week H, H of the girsher which consists of a stingle place. At the chards the week is resintered fact by wide, that plates J, Jand then by angles S, E which are rivered both to the web and to the are sensibled chord plates, the riverts passing seather cheet paper, the cricia passage right through the whole of the assembled material. The pair of angles 5. L placed back to back which extend between the chards serve as stiffeners to prevent dotcenation of the web. It will readily be endenmed that the restiffic with which the drifts can be swung into any desired positive, greatly furtitudes the rapid res-cation of the work.

cation of the work.

Another of our fewelges shows the riveling on, in another large bridge works, or representations and the state of per beyond it a portable proper per in the passe there has been a
per development in the size god power
or the Gaze



on its side, consists of a web, E, E; upper and lower cheel plates J, J and angles K, K; and web niffening angles L A, B, C, D, are carried in radial arms, attached to girder on the legs F. F of the mad

a there are highestly rivities estably of exercise a pressure of 100 bigs on a let rivet lend After the bridge numbers here love completed at bridge in to be exected, and it can readily be under stood that the speed with which the secretion smooth peods very much upon the extreme provincy with high the work has been dute in the folialisating shops which may be formed several hapdress or through

Treety-fire or thirty your up, Asserting bridges of Wednesday and less sure closes utherwally of what is known as the eye-bar type, that is to may, while the he cross-setties, the tension sensions about incom conduced of medium; that in that here removed with an eye at each end for engagement with a common pile. used in fabrication and less theff to repli erection

In those days, mercener, even in bridge of 100-feet spen and less the open trials-guisted trace bridge was preferred. Of late years, leverer, there has been a numbed tentime; tenunic gloried plate leides in which even the tensor menlares are built up from according plotter and shapes. The first of the plate girder and singes. The first of the plate girder which formerly was restricted to very when apans, has been extended until to day we find that 100-bux span plate girders are consists and not a few of this type have exceeded 100 feet. The issuest plate steel girder halfs at the first works measured 315 flex 6 father. Take type has found its most entended use stoons

Methods of Evolution PROFESSOR J. E. PETERDEN of 2 Blodes University Odings, North Africa, hier an interesting discussion, in Science Pragmas for April, 1924, of the methods of evolution. Professor Interest questions the orthodox view of evolution by gradual transformation. Mendelson, he says, impriving as it does the distinctnew of the characteristics of an expension and the conception of discrete permissi factors, is one of those fundamental prisriples which indepently confront as when so try to interpret poological physiotests We see so securitiesed to think in terms

of gradual transformation that it is with some relations we turn to discontinwhere of our communities married an and breedup is founded upon gradual transferrestion, jet if we are to several Metabilian tenchings this is not the manner in which the change from one form to abeller has overred, rather, each modification is the other and discontinuous in its nature, and start from these which have gone before and from those which may felice

In support of his contention, Professor Duceden uses his studies of the estents. The action, he says, is unique aroung living hirds in that it has lest two toes, a large famer and a would regar. On the theory of professi transformention we whould awares that this condition has already envised through economics states from a four- or even a freeded spreader, and is neesible trapeliery to still further retragression. We be earwer, emmissionable pulserentelogical existence against sty evolutionary change in the two of the outrieb within a comparatively recent geological period. If no

alteration has taken place in these street terms during these ten of thousands of pours, we may well be awared that they have been their characteristics of the hird since the time when they first needed or present relative propertiess. Func stemal adapterality is people's me con-cerned, for, if it he held that the onetend condition of the bene is adverted one for right progression, would not a broad, smilded, single for he more scrape-able also for the orrein? Her the two ters seem us well from in their present relative proportions as is up; other fra ture of the lind. There appears, there fore, to be a discretiones, a completion about the restationary stage in the fast of the actrics which would hardle be experiod of a condition which has been at tained as a result of articles, continues transfermation. In conclusion Professor Durales says: "If we accept the Mendellar interpretation of squarte and in eral germ places for a fiving transft series, are we not impelled to do the same for all the widding transitional serie for all the widding transitional series which paleousings affects, and which are deemed to be the best filterrations we process of continuous retiregenest- revisthat "May not deate over he cast time the accepted physicsem, say, of the larne, as interpreted from palacentringial re-orde?" "Mendellan scena to impel us to think of the many known true graded writes of lack extinct and thing ene of lating after sport and in pendently, parch ofter the memorr which

Morgan has shown to be the case with resent to the could write of select baths. rolers and ope rolers presently asset the mutants of Drocedile."



ing and riveting up a 35-ton election for a large bridge

The past The Gaseline-Electric Bus THE mailton-incite but is drive by a queller st-gibe as is any other bus; but, in middles, it carries a 42-cell strongs buttery, two driving masses and an

Way carry all this entry weight; why as to the theorie of installing all these outse power unite; and of course, that the gaseline regate drives the generator, that the cirrent generated is possed to the makets which drive the rear wheels, and that the storage

as a sort of "Hys.lefor the absorution of ner generated in ever of revent peed and for utng this soored power in times of boary power

by Prof. Morke Arctel of the Department of Electrical Engineering, Columbrical Engineering, Colum-bla Entwersity, and W. Brown Meetin, New York Oltz, and has been in con-

plar service for a-versi elect of elithic file negal green and throwing tch, the driver turn

olier situated just at his left. There tralley-car restroice structed just at his left. lig to seven speech. The get-owny is very mold, from standing to it miles per hour requiring but seven

The gaseline-electric bus is by no meson a frenk or "Might's revolve. It was not designed to attract atten-tion or to tiekle the vegity of those who have mechanical complication. Every Senture contained in the how has not merely an excess, but a very good mechanical and economic reason for being included in the design.

First, a lifth furl economy is souds pos-sible by reason of the use of an extremely small engine run with an open threatings long as the weld'de is under way. In other words the operation of the power plant, instead of being intermittent, iconstant. Since the storage batteries are always roundy to about ourses power and es the pewer plust is not large enough as is the case when accelerating or climb ing a hill it is upprecessing to carry special gine develops but 20 bresspower at 1200

7.9.01. Record, the ristch and gear shift which to exerci condice necessary high scaletmeare features are eliminated.

Third, the feature streeties deit up of the Unstrution entirely elicit nates the expensive and often insul-#Bereist

Fourth, in the collapse growler which rapid acceleration which is referrably im-perious in tradic is fluided by the top passet of the engine and the monosity of The slotting buttern is not intended to drive the testicie without help from the power providing unit, but it is capable of driving the vehicle, weighing 10,200 of driving the veters, unigning inches punds, a distance of the retire. This is enough to study the veter's to get back the garage in most cases when may serious freelds in upselfates the region, or if the gravitar rate set. The butteriou

are entireled astenucleally to that they may charge or discharge as exceeded do mands. In addition, at automatic device cuts the engibr speed from 1300 rpm to 500 rpm, when the vehicle is excelled or standing will The purpose of to to present an even large of the stonigs betteries, The sparreter develop 120 angrees, at 100 mile, while the two propolition makers are taked at 6% bacompound

This bus has operated in all about 10,000 raises, partly ring yes and operators in on some square billion parily in cross-country work near Philadelphia and 3000 talless on the 80th Street run in New York, an extension sower run due to the heavy traffic in revis hours, the never run wir to the never trans to view their, the number of stops per talle, and the grades encountered

Accept, no expense whatpever in the multise the electric equipment, except such as such sense of the contexts and watering of the bull The mights has four cylinders, each means by 5% inches white ordinary "pus" buses of equivalent varying extently (that is, 20 passengers) saming for

ring 8% cylinder rightes of about 4% by 6 Inches size, or nearly twice this size. The passine consception names from seven to time miss per gallon, and a speed, on the lead, of 30 to 35 miles per hour to doubted the to of being 11 miles per haps. For still lower at preach-prove active

ASSES 15

from protect to first point, as do tenlicy-our matternet

UniScation of Australian Bailways NIE Government of Ametrolic has a plan for unit ing the several state railways of that land. Owk o the fact that when the Consumwealth's rallway were feet bellt there was a strong sectional facility which prevented the growth of a standard-page system it will be necessary to other next of the militar stock well us to change the freedoct time-lack gugs

state of Timota, and the thrised-or six into gaze of a part of the railways of South Americk to a simulated of four feet, eight and one-half lacks. Herefolion it has been necessary to break corpus on the transcenfigential cultivar motio on exterior the worrel states. The outfastive plan further includes a project for a profit-col-segit respectational like from Affilia for the Part For Large to the North. Two start surm of this First Farmin in the North. Two short spore of this line are already in use, and it is those which are to be rulented. The plane do not, however, income bringing their exist eatherly ingester as yet, as it is not felt that everythe conditions warrant the extrem

and differential in reviewed by indi

g the Toeth of a Day he undivisible position of her use to the best. This was a the machine arcident proof particularly of operation." The punch press has al of the most desputes tools ever de in a report published by the Ind este etted

> list in regard to the bi recoiting in the perother single kind of a feet. They caused a l of 92,778 days whire w

44,220 races days than was due to any other type of artifant. These secidents rost in concerrestical attention \$67,5
which was 20 per o any other them of figures it will be even th In point of severity Jury, lost time and ex

settr of all The American Engineering Standards Controlline has formulated a rode of N2 pages in which 20 excitein are the manufactured. Every doud in taken up where there is the significant opportunity for accident. The beautiful are too masserous to list here.

hannels are to misserous to list here. The most generally successful methods of side proposition are those in which the material is plant and removed without the operators hand being under the reas of any time. They clusters will not be reas of any time. They clusters will hannels and prevent prelimes council
fauthenties or other failure of the open

as well as those caused by mechanical de-fects. These methods also generally resoit in an increase in production and a decrease of spellage. One or another of three should therefore he more The extremetic and must estimate a

are increased productive and have elimeted almost entirely the postbillty of sections. They may be classified as follenu: pash or pail automatic feeds; plunger feeds, chuic feeds; revolving, or dist feeds; sliffing ties, sliffing feeds, and the reces states use, many even safety feeding springs.

Barbeday guards are of great in-periates and are of many different types.

For most hand-set himbling week, and

for exact forming operations, complete pro-tection can be provided by an exchain tection can be provided by an entru-guard with space between grand and los die sufficient to soluti stock but not flag the sufficient to soluti stock but not flag -tet exceeding three-eightts inch. So guard is often attached to the stripper. To petral is view of the work the guard or the front pertis of it is often made of wire much, wheel glass, or notes. The guard may be in beloespide from or in the forms of a sportup. As such guard hay the the size and skepe of the doi: it is executed that the discussion of discovering the contract of the size and skepe of the doi: it is executed that the discounter or discovering and solving the size of th that what the the checker or dissected ande responsible for procuring and set up a proper guard for each new operation the large user of seed guards can them to standard store; the open each rear reductions through which the upper dispasses, vary-ing at one-lack intervals. For complete protection the stands should exclose that year as well as the from said about of the year, or the

lower die should be extended by mouns of a b plate so as to present reacting in from the si mand most for meeting have seen developed and as used assessmithly an operations whole automatic fee-or sticining guards are impractical. Presentatic device have also been used successfully. "Two hand" oper-ing attractorests are whushle and are were and if 8

2.790











Grand for fender die rises and lowers with press atroby



THE PUNCE PRISS, THE WORLD'S MOST DANGEBOUS TOOL, AND HOW IT IS ROBBED OF ITS MENACE IN THE UP-TO-DATE PACTORY

Charcoal, the Chemical Truant Officer

A New Process for Catching Volatile Solvents and Putting Them Back to Work By Ismar Ginsberg

example, it the artificial teather industry, where, while a large amount of solvent is lest in the daying of the where reaction consisters or unfilly finding, where such products or count finding, artificial leature and fully extracts are being treated—to name a few only of name—it is proved practice to permit a large volume of cohelle solvents to go to waste. Especially in the artificial leather factory. qualities of these actions, which could be used one and over souls if they could be be recovered, are lost fireigh virgorathe. True, chemical messes through enquestion

are studiable for recapturing the alcohol. etter, teacher and whatene its question; but the itendiation of pixtis for this purpose is so extremely expender that many a man riarer besitates to go to the expense of Under the amplies of Bayer and Co. one of the large German chemical trusts, a new ews has been incredited for the recovery of these solvents. In the fundamentals it is simple crough. We all know that a part of charmonistrat about to a refrieerator will web the other that may be evalued therein and which might otherwise socii the hatter

and other find should it the levines. This property of spending that and second in the location free in other than a describe scale in the nameforture of graceastic during the our, but in rolly of the atomic suggestion which this application might have been expected to give this familiar property of charcoal has not been utilized to say extent industrially. Under the direction of Dr. A Englehard, the arill-known district, it has now been applied in the recovery of relative selection, and has In the industries where should and its derivative

ether and acrile enter, are used, as well as those on phyling beared, scenario, bengine and numerous other property to the security of substitute and substitute of lage not about to the securing of substitute advants within shall give the same results and which at the same time shall be less costly, but also to the recovery of these so from the most gaves evelved in the varieus postuments in which they are used. The old methods of recovery remoist either in cueling the space under pressure country thereby o ecipitation of the vapors; or in wash flag the solved vapors and air with our bus absorbedts, which either have a parely physical settent orthog on the supers, when high-helling olls and alsohale are used, or cise a chemical action, In the case where suituric sold, cressle, etc., are used. In the first progress a considerable amount of covery in procured progration are very large and expensive

energically they may be completed only where the waste governmentals high nor centrations of the solvent rapers the second process, most of the absorb-ents used have very little absorbing power, and after they have performed

their function they must be may territed below they can Herr relation may make at regression becomes any one be revised. Only suffered wild, which is used in the absorption of skeled und other, and the farmy olds. which my need to much out the bests contained in education and Historianing pro, have resumed any in-

dustrial Incertupes apperatus in recovery and in the one where suffictioned is used the acceptant trust also be covered with a court of lead in order to protect it from the estudies action of the said. Then again insecurit as the charleston of the arts. Then agree insented to the standards must be recovered therewhere, a Lorge concentration of strain is ottorified, and in order to endoor this communiand the cost of the operation it to promuce testal complicated and appendix beneviously and expersing appendix. The cod of the manufact and reperring appropria. The cost of the operation and molecular the apparatus and the apparatus and the many are so high that it just alway page to number under certain conditions, and mesonwards, the ess is used only where the volume of one freeted is very large. It is for this reason that the process has not been installed in the smaller industries, as, for

leather, neverthelms to attempt in made to recent it.

The cost of raming the process nan fraud to be greater The tests diesdrastage of all their processes, but ever, is that bet the of their reveren the signer from the water gaves whitegot having a part of them be litted If an attempt is made to conduct the process as that the solvent recently is 100 per one. then it is freed that the number of scrabble

towers is so large that it becomes also tapet impractical to operate in this fashion. For example, even at low temperatures a trace of local in the heavy olls that are employed in the network process will be sufficient to case a vapor persons in the absorber 5-qual so high that the bound super will be in equilibrium with the beauch in the absorber else; in other woods, no more beauch could be removed from the waste game under these centilities. This forms the practical limit to which the person on he probed, and any

gas which contains less than that concerns than of benefit on not be treated. It also means that the piece heating the absorption appendix will always contain that smooth of heat which will be absolutely lost. When the conventions of best in the gase that are being worked with is not very great, then this less may be determinative in the orenance reverse of the

In the last few yours a curies about process has been invasted and perfected in the Payer dynature plant at Osingae. This process revision empletely relative solvents of all such from game which contain then in even the smallest exponentialless le charroul is used in the form of welight and fine particles about the size of herity grains. The object of making the charmed in this form is to take advan

both of the condending power of the excluse of the charroni as well as of the almostic capacity of the nutries. Charried to this form will their deer 2) per rest of the weight In other, already, several, benefits and bened, when the flow of gar is about 20 rentination for several. This mades to the eigenstration of their school mustly front in technical waste government. The restricts of the first of the gas and the degree of expostration are two inperiod: factors is detectabling less much of the solvent will be absorbed by the of the national will be solveted by the character on the gas process fattegth it. Under better conditions of iron good and greater capatitration the charmal

about from 40 to 100 per cept of the votable in solven, sporting to the specific gravity of the same. A kilogram of the distress—about upe cubic motor of the material will weigh only about 200 granus—will take up 200 granus of leans) under the conditions described plans le extracted with half a liner of any extremt and will

the refinery type of embener, and if the spirett is inscially in the water, separation is offered by the

feel perfectly dry to the totals.
The head that is formed between t selvest and the absertest in a very fast one, but the solvest may be rethat one, but the movest may be re-covered by besting the carbon to a troperature over 200 degrees that grade without the use of a vaccous. However of the poor last embelsativity fivestime of the poor taket enterestings of the earlies this method in her very effectst. The solvest may be recovered from the absorbest may modify by his-wing a current of steam through it The stress is introduced at the trp and tower. Hough the numbered same leaving the apparatus at the bottom

the statt of the process vapors of the trare softent are obtained and the a mighter of the solvent value and

strate little state and extent rather than

stherpin of any art,

um of a separativy tank, while if the two liquids a middle in each other, distillation must be reserved. To be the substrate the control has the structure to the control of the control has the structure minute particles, a few millisterized in each separative to the control of the mass. The initial process showping contains the developing of the bases of force; and when we reflect that a concentrative of or this structure has an inner surface of some of the control of the surface of the structure of the state of the control of the surface of the surface of the structure has an inner surface of some of the structure has an inner surface of some of of this structure has an inner surface of some 9000 or quare natives against its quare continuents for a solid cube of the same size, we can appreciate with the process gave note. The file that were these nations, however, proves in thickness rapidly; and as soon as it compasses a thickness of noise 5000001 utilization corresponding to the radius of noisequiar action, the excrepateding to the radius of molecular action, the notice spece between the charcoal particles legion to fill by regillary action, as indicated in our third decre-ing. A is here the charcoal frame, & the absorbed this and C the further find drawn to be cardiary from. On the surface of this first a replaces is f

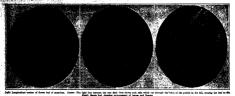
and C in the latter had drewn in the quility blee.

John Stein and the latter had been in the quitary three plants are the release in the species of the plants are the plants are suppressed as oppressed as department of deceases fingle in the size of the plants are suppressed as deceases and the plants are suppressed as deceases and the plants are suppressed as the plants are suppressed as

unied the super-oir mixture may be abus to another charge with fresh alexatent. Steam is himen into the automical absorber the the country D, and passes through a perforated which sprays It squally over the shortest mass. The nessed is heal-doublated, and an auxiliary cell through which steam is blown continually keeps the working steam but enough so that It is not precipitated to liquifrom on the surface of the charcoal. The steam curry-lag the solvent aspect from the charcoal loaves through the outlet if and is conducted directly to a conducting energing to the directionness. The charron in the ob-sorber is made ready for the again by a correct of lot air which enters at J and dries it thereughly, folhand by a rold air-blast to cool it off.

the man train of pertilar value. It has a particular advantage in its ability to about several differen udentings in its arouny to meets service conven-vapors eleminatoristy from the same which. When these are of considerable variant degrees of voictifty, the less rotatile ones will drive out of the charcosl the norre volutile oper which it first takes up. treathir to corner up a series of absorbers and obtain a reputation of the size thed verses according to

> The cost of the apparatus is now paraticely low. An ecdinary cast-feet vessel may be used for the absorber vessel may be used for the shaoker, with such protection see the stages of the absorbed vapour or their while the may proceedable. The speak takes up-to mostly. The elsect consumption to the mostly. The elsect consumption to converse all rest. Suppression of their effects and exacting its first, allows at 190 fagerees Conjugated in not absorbed by the charmed at all, and it is look tensors with a drying of the charmed at element with a drying of the charmed at these costs and owner and the ray law. appears, of at least as arrive is not repaired it weet. The cycle of open



What happens when the larror begin to full, as shown by micro e-section of leaf, stem and had

When the Leaves Begin to Fall By Dr. Ernest Bede

WHER has come and gent. The fields, covered with middened, are bright with the long spikes or with pedeared, are bright with the long spikes of heads of these harbingsers of natures. The brank has the collivated farms and carpeting the hillstdus, lowly beginning to turn a nickly yellowish heaven, sering as dirty spots earning the bright goven follage, a natures will have made the colorful extracos, and with their fery coleration. et as the fullage of the various trees and shrule

hat as the foliage of the various trees and shrules not appear at the same them in the appear, so the rest file at different periods in the fall. Maple, beech foliately let their leaves fromy when the frost has clad then and the five cold variant storms have been then. But the winter ook helds tightly to its of beyon, like the nature to its grid. In fact, some and belows, the the intert to his good. In fact, some them leaves will still be on the traigs in the spring, but the new shoots nakes their appearance. On the her hand, the foliage is scripped from the white-libra-t the cool whole of early actuars, and the walnut tes barely survive the statemer.

e time of leaf-fall may be hestened or delayed—all ada upon the westler. But before the leaf de-se itself and drops to the ground, it invariably ches toet? and crops to the greats, it immunity susteen its feative gark. And line dark herest color-ne of the beather is produced by the same material set is in the red beech; in both came this shating is an itempt at proceeding against the strong incomsive rays a saturate afternoon was, as contrasted to the chill

(the assume afternoot was, as outerward to the chill foresting still still.

The change of color is must readily observed in the either, that part being zone strengty pointed which is most exposed to the rear. The light yellow and range outleted that are predoced by it.

Effected overtag material. It is the same coloration which the convent of values.

uses which makes the curve years, purple color of the best leaf curve, a, in its derivation, to the color in Cherositus asses. By of the colors found on the fallage ay of the colors from 6 m to frilingle, in statem 6 m or zale- Guring to. m, but become visible only at this other the genel molecular motion, the oppin, has disappeared. In the fail, the visible of the plant is reduced, the visible of the plant is reduced, but the property of the colors of the table place, which say be of use at the time of the same second or to the colors of the colors of the table place, which say be of the six to the colors of the colors of the table products left in the leaf, pre-ge at they do the auturn celevation, if the fracture was to be plant, in fact of plant of washing the plant, in fact of plant of washing the plant in fact of plant of washing the plant. p which in not fro-ple. The cause is senal cycle of life chig, and dean are to fishe of a chain m. Spath, and death the land follow that

in order to give back that which was taken from These are not the capast, they are the results. Two and shock have prepared themselves for assalts for the coming loss in leaves, they throughout home prodated, by a certain formation which is slowly taking place within the plant, a position, which grad share off the leaf from the motion plant, then do: but to a sire and Reporting doub.



The aware left on the twir by the failing and the final simpling of the first of say is the leaves. The willing, the changing to a block, hower, yellow, and red is not caused by freezing but by a drying red. Proof only severy after the last whose severy have reme, only occurs actor the title off tree and shows without every, and at this title off tree and shows are have. Hitter their leaffore retire and brunches into

under the feet of the wanderer, the \$05st win fully low the food leaves high into the air, now be ing a swented in wear below and then again carry an helter shelter to some other, more o The Physics of Snow

A DIABATIC cooling, i. c., cooling without either acts or loss of host energy, plays ne part in the

demand of mints and high, because the persons changes in any given later of the strangement ups relatively small and slow. Appreciable a helir cooling can take place only when air is refer in the entagenters, with a consequent change of new more, and then the coding any be large and to When air not saturated rives in the atmosphere temperature is reduced by about one degree On for every 100 inview of secont. When the access carried for enough the dew points in reached, as which may further rise will come evodenation on soriei prowat. As the assett is carried beyond the point of condensation terre and more under posited, with a conservant increase in the size of the drops. This is the matter in which clouds are former and there are very good remedy for suring that it is

the cuty way. Now force over its severaling air curves in wi there are solidified cloud particles for parish. whatever the naviet may be, as some us the lecrystain are issued, further embenution takes to the raper contensing directly into the solid state w me topor contensing electic into the solid state with sent first pring through the liquid state. The crystals of water are broughted prisons, and water in the crystallize state in the atmosphere shown all the was during shapes that the form of crystallization can during shapes that the form of crystallization can

liesing once started, the reputals an using one states, the reyellar may guilding their central sale, giving rise to long I prison, or along their siz area to find in the second places. Secondary is uniform, so that the result is a page broagened plate, at others the great along the axes is seen racid than in the space between this gives rise to a shaped crystals, having a beautiful fe ry appearance.
The actual crystals tury in site.

The arient expense tary in each arient minute crystals which can scarcely be seen by the railed eye to platter a quarter of an inch in diameter. In cold region the expelsis are small, because there is little water vapor present free which they can grow. In the Antarctic Circles the winter only the smallest crystals are need, so small that they are elmost like dust. When crystals form at compension our the freezing point they grow to their heart and treeming point they grow to their largest alon. When the sir is full of large crystals frequent collisions take place The crystals become interforbed and tradies of many expensiv crystals an ferrard; these produce the redinary spore finite which, on account of their sine and wright, fall relatively rapidly. It is to ages, fact receivery rapidly at he to see lactor that the term steen should applied. With this postriction, were he avedled overse only when the temperature is new the freezing point.



exempes amounts of substances to react with nother. Thus, four ists thousandles of a green one another. one another. Thus, four his thousandhis of a gress of pistitizes will cause the unitum of some but quarts of oxyges and hydrogen. Outsigning plays an important part in incharing. The anomalowizer of arthratic and from the elements in made possible by plantane and other notatile entitipets, the numberciers of a fin from an old, as in the case of orticates of all the effected by

means of a nickel cutsiyed, the production of mirrates from the air is a cutalytic process. There are many

Living Catalysts

a living equation that passesses the portion certain important character marrieds to Three are not only of prime industrial sign they are respectively for the changes that take place is the hierant below, the dispution of four in particular. The congress we extremely interesting observation. The congress was extractly interesting observation. They are most observed expension or other extractions. Due to the particular extraction of the congress, in solid to congress to extract for the money, in solid to congress or construct force the weight of country, for builded thousand times its weight of country for building control of the congress of the congress of the country of the countr they are respendible for the changes that take place to wright of mornes, ordinary super, into layort man In which of steems, estimary super, this lawer super which is quite a different solution. There are valley a few surprox. Among the most inspectant is the coping-distance. There are in result; quite a few varieties of distance. One such variety is noted from belief rush. This engine has many in-ductrial uses. It presents the power in decorpies and submitted streets and the intervalsion products obtained by the decorposition of starch, such as dis-rich. This is in the powers of y-denies calles, believe the

It should be pointed out here that no enques are bound fright plones that are ful dipactive trace of "bis" because system from plands and organis thile constitute the dipaction of the body. The converse are the active age dipaction of body, consensating with the way in the saliva, which has the effect of partially electry fools and poing through the poor gentric plains, the trypich in the absorbant

The original raw non-

teriors are subjected to treatment with chemical agents, and in with chemical supers. And in several cases are also some case seekativel spense are also applied, either alone or in combination with chemical means. This results in the personal of the large amounts of extraoreurs matters that are usually hand in intinuis udulature with the cellakse ureally found in inclinate orientative with the certains in the raw nesterials employed for the manufacture of paper. In this respect reference is had particularly to the raw material word, which is the chief source of apply of the pulp from which most papers are made. Bags, old hagging, berep ropes, straw of all kinds and made cellplore materials, such as sugar-mite inguise the stella, etc., are also goed in some quantity, but by for the president proportion of super is made from

part of all extraneous solutanees and leaves helded the comparatively pure collainse ther. This ther may be made into a paper without further invations. But if this is date a very poor grade of product to obtained If the sixing treatment or a greater part of it is eliminated, then a paper is obtained which will not hold tak. Newsprint is one type of such a paper, while bisiting paper is another. There is a marked differbiottha paper in another ears, largeyer, between the two. Nesspeitt, which is the chespest form of paper, in purposity praise uniform for revenue of scattering. Share

is ean be treated, and just after the loase threads from have been removed by singuisar, the size added The Whys of Paper and Ink

of it in the paper paip to make such a cheap product as invespriat. Furthermore no real neverther would be gained by its use for this purpose. Distring paper is also investigatly made uno but here the conditions are different. The paper but here the conditions are different. The puper start be under with condessable one and our central trails of word evan be employed in to manufacture. Writing puper on the other hand is promoved stand. The blanch as in the rease of listing puper or when vertice on such trained pupers are require puper or energetist. All degrees of soling quality can be ob-lished and without pupers are required puper. However, the same estation of all taking miserials in rods, the product that to obtained in the delibration.

of terperate from the sap of pits trees. Its order to be able to use the rules, it is first expverted into a restante by means of causely sods. The skeets in them added to the leaser in which the paper pain fibers are being comminuted and in made to conhis in a definite properties with water. After the filers, the roofs in fixed on the filer in a perials form by the addition of sulfate of alumina. This perial takes the roots on the filer. There are various thearies arding the exact reactive that takes place. The paip is then made up into paper, but the paper

does not become truly sized until it has passed through the drying part of the payer-canking machins, and the mazzes in which this part of the process, namely, the drying of the wet paper with in carried out in a determinant factor in securing a well-sized paper.

A Book on Tidal Power

White the development of tidal power has branched inventors for many years, no tidal per where of any appreciate size has bittered beet one streets. Specific science for large-scale development have been made or consideration in both force British and France. Mr. Nurman Davy has been written book. "Studies in Titlel Power." Four milities here-power mild be developed at TI state in the British hierepower rount to enveloped at its scene in the lifting in off these of art in Statistics, 20 in Sections and three Levines. At the present time, it is dealers who the investment of any that power scheme continues in independent unit to supply power for critisary fastriel purpose could be justifed econositallities other hand, there can be little doubt that when my chemical or manufacturing pricess because available to which electrical energy developed into substantly can be economically utilized an developed the question of the utilization of tidal power with be come of very grant importance. Under such conditions no storage system would be required, and the cost of the energy would certainly be less than that of one developed from any other source at present availa. There seems little or no hope of success for small play

HE FIRST gas known or an to sty extent was natural of the carti. In spring therees, a she on a certain hill, on which the strate of

Deight was recognify located, and suddenly for no reach that he could see, be was partially expenses and become filteries, as if he had include two much ers murses, as it is not in bruses a lake of the grow. new in him styl his plight iteraturation of some styl spirit has the privariant of the country nove realist the register of Delphi on a spet when natural gas laured from the certis and the privatess. being exercise by the carthy enegation, delivered the

Natural gas was lowever, used in a seartiful by the Chinese shortly after the opening of the Chini-tian set for such purposes us the emporation of soft from brine. It is soft that certain between in Pekin were branch—If not lighted—with the gas la Burepe the first use of gas for consurectal par poses doles back to the experiments made by Mandick.

poses doing back to the other herein caude by Mendels, the Bighted his hence with 1 in 1701; and to the work curried is a coree possible for herein for Wilson. In the United States the Birth, and plant was established in Bullionere in 1805, which was followed by one in States in 1801 and one in New York in 1803.

Natural gain is still used in large quantities in the a, although the limited character of the

Gases in Industry and Home

rapply makes further development of the tea impossible and it find a brushed curricular the revenue uses to which it is not. It is given from the finds and used to which it is not. It is given from the finds and used this enclosed for some inflantial purposes. This gas passesses the highest calmide power of any gaseous for, possessing two 1000 to 1200 british thermal between the finds of the simple between the first the first passesses of the simple highest-notion, receiving of the simple highest-notion, receiving of the single hydrocarbon mechani-The restardating par thirt was first made was coal me, ten in, the gas that is obtained by the establishm of coal in the aboves of all. At the present time large quantities of each gas sets not in this country and all. The gas is made in mostly and in some surface and that it is not the side of the entire and all of the gas is made in mostly, which are surface period or included and is reduced therefore, purified and faulty discharged through the gas lines from the lobble to the consumers. One gas is used to a large restore in included processes. The calculate powers

ratios errorling to the legal regulation. It is gen-erally in the neighborhood of 400 to 600 British thermal stills per ratio floor.

Water gas is a distinctly American development. The first recognish water gas plant was put in operation in Phonocyclie, Pa. to 1872. Water gas in made by the neutrino-of green and investment curion. "The het curben breaks up the street time it

give earlies measured. Thus water go is essentially a mixture of bydropen and carries measured. Water gas is sin known as blue gas for it burss with a blue fame. Eus known as this gas for it herea with a loss fator. But me has a califord owner of neural 30 to 300 British chemical with spec selds box. It is an ideal first in the contract of the california o

end from the bi-product raise wen in the manufi-on meditarion does not the record of us, some of meditarion does not the record of us, and record from the litter formers sating pt into account from the litter formers sating pt into the other interesting as which is fabring used to other thereofting as which is fabring used passes. This past is noted to the product raise steps grade that, even such product as cruck liquid; and the contract of the product as the product of the product, which is descripted by the bestide the product, which is descripted by the bestide with other passes.

Inventions New and Interesting

A Department Devoted to Pioneer Work in the Various Arts and to Patent News



rings That Oil Them M UCH thought has been given of him years to the possibility of making bearings self-lightlesting. We illustrate th what is, so far as our observe

tice goes, a rather novel alturk upon the problem. The bearing surface consists of a metaltic lattice-merk embedded in od. As ner photograph suggests, taper surfaces of the metal and of the wood form part of a coursess sylladrical surface. The metal is supposed to take up the wear; the wood, seaked in oil, to senty intrinction for a view leng week and to be reservable in ride reason has north factors of townshing shows the bearing partly out away to

New Fan for Manhole Ventilation ONE of the problems in the duly life of the mo, electric light, street rall way, and tries into companies in the ren the men bull or extended to the ok in them without believ the effects of the gas which accountates in the funtion offers treation contractions in sucking a student-witer electric line i has best endonery to he electricfresh ale down tree the membrie through a capture home. This is all right where Not in available, but it often happens that manboles in which restitution is tial offer no facilities for tang wires. In these cases the telephote and other ecoposies have he years used manually specifed geared forge blowers. The arrount of six which these forge



creak not cally ties up one or two men. as the case pary be, but it is monotonous work, of which the men are upt to find a little twee than enough.
One of the relectute recountry reently put the pooless up to a large blower oneous and asked them whether they could not furnish a governous driven unit for this work. The fun comhas developed and is now in be the little direct-connected M ing the little direct-connected blooms shown in the plate graph. This was taken during the deconstruction of the bloom to the officials of the telephone company, who, incidentally, were scriptly unified.

with its performance. The engine is a standard own upit, four cycle, with a single cylinder 2% × 2% inches and develops threequarter hossepower at 1900 revolutions per minute. The goestee task and of racine, and the magneta is built then the fly wheel, so that he amplifully fallies of batteries are necessary. A governor pro-vides for regulating the speed. The fun will deliver induses ranging from 775 to 1900 estér fex ef sir per minute, de pending upon the speed at which the engine is operated. As the unit weight only 65 pounds, one mun can carry in anywhere; and as it will run too hours on a gailer of pushing, the cost of oper-ning it is small. Where it disclares two fiego biveces, it will some pay for its righ the saring in the believ's wages No far as the assaulterspees knew, it is othing new in the residiating line end they believe that all the mable will

aties will find it worth having

Taking the Poisson Out of the Paint Spray

STRATUS on a towns of attache Sprint to its series is a pro-stare regar, being used in a wide variety of factory operations on large and small numericators) articles, as well as in out-four airpetural works. But the pulatapraying process is one that, till now, has been recommanded by at least one rather The east spray pain serious factor. Too can't spray publi without having meet or less permention of the atmosphere by the funds; and paint contains amonic and lood, which make it anything but desirable for trains it adjump for transact are breathing persones. A recent element to obtice the dangers of palenting from this source includes a title gas-mark reacher, which is actually pixed to the same air blast that operates the spraying nearly, so that the paterer breather under forced draught. There are some niv needle valves for controlling the pers-grave to the nossile and to the mask, so that they may be varied independently.

Wire Nuts HEEE to a letter, realer, negter was talet the ends of the vires together serve on one of these little wire train and the job is done. Then, is no post of widering and to need of toping. The projection against contact with outside tilings in sec good that with naive laws the appears of the Universiter's Labor-When one exprehens the Inchie of the wire put he finds it has a bress links

which is tapped out with a right-how thread and is split lengthater in free pieces, the split but extending all the war down, of course. This permits it expend to a everally extent to take These custociors came in a purific cli sizes. There is a No. 14 and a No. 12 ray, and they take from one to wires, either No. 14, No. 22 or No. 25



iro, lie. The insulation is bakelite and it ex trade about one-built lack beyond the bross Haing, this being for the obvious purpose of coneding the shank of the wire expedenable above the creperied Speed to ope of the chird admintogers pelito funciar wire auts. Figurity o must's three, can be make up a regular emmertion and motion in for a contr worth of thou? He would have to do it to less than a rather if he did. But the who got women on it is lifty a purket ful being enough for a day's work, and It makes a fire outseifer, the brosthrough cutting into the wires decide. Wire copie are the product of a New

Steel Ties for Mine Railways Olis and end are generally leveght but shart by means of once building con-punctively small question. To make this absorbitation transportation perother, male are hold down temperating on time which, of entrue, are not required on the which, of entree, are her required to be very heavy. In place of the old nowing the modern mines are now using the of rolled steel section. Steel tire are strong yet portolie, a miner being able to carry ben or fifteen of them on his shoulder. They are not thick, thus allesting a gain of beginner in take passages where every lack of hondroom counts. This makes possible s elightly greater leading of the curs. Three steel thes can, according to the Subbleton, Pa., mediafactorer, be used for an indefinite period of thus, taket un moved and out down amin three. Wend the under station tree



The clip that permits quick work in setting up portable railways with

or twice before they wear or not on These ties are equipped with a simple light rolls. The tacking clien may as be turned into positive by names of a become or on any. They are held in place by needed of a rivet. The tie is simply slipped under the rail, the but from det tile right in Shortetien en gage the call as the tie is moved side wise, and the city are turned, locking then of the without taking the track elle will prolingely hold the call in plac secrety, but there is a reserve city in case the other is injured

A Simple Stabilizer for the Car A segrinorizate, collect marche A turn has found a new way to save to through and business or roads that "stocking." The device which off The desire which effects this is called a stabilizer and it is do sisted to be attached to the our suctas It consists of a nairty which is set acted to the chards sorting fast form of the suring sharids in resume of a city which is support on. The operating principle is not alongs. When a burn is inversel by the our the chards spring is defected, the weight is thrown in a dragged directly and owing to its crita it tries to confluent to go down moight in meanted then exerts a grepressure against the leaf of the spring nest to the moor or master but. two are present together, the internal man the is decreed, and this during the re-

1% inch, 2 and 2% inch springs. are only three puris to the stabilities the spring, made of off-respond spring steel, the left custor, and a relyant tension bolt to lock in edjusted posts





besity as the end of a core

etric Irons Without the Cord THE electric long to a great one The electric tool is a great the about not blind complete to all draw backs which it may possess. As conven-tionally offered, it does possess dissi-tentiages. The cord that joins it is the modet is a fractul trainmer-continually jeting the free, continually getting twisted on itself or on according class continually revening clean handler chiefs and other rand articles on to the five Manager with the corner flow ing stendily are in preconstily the case, the irea consumer parts falce than in est the electrical parts before they need be murn out, etc. The new electric-less equipment illutrated avoids at this. The original of

value which reconstructed the electri trips to the stone were challed by its use. The new assembly provides in realthen an electric look, but this store fetaz on the end of a runi fuel like the electric from, it can be just down at the insper's eiters and the trice agrees the laundry ther are just as effectively eliminated us in the electric loss of

fauiller design With this electric-brazing have ordinary loons are used. One of these bests while the other is being used Miss either from rote on the part of the better," the electric circuit for that side is much, and beating proceeds. Just as were as the ious is lifted, the circult is broken and current concer to firm. Is necessary to host the irons, and the treatifity of leader the corner on to produce a fire, is impoly eliminated—one has actually to leave the leas on the store to bring along this result

The Painless Needle Threader COMPLISTICATION of the task of threading the socile is the peal of the sexting morbite attachment trated between A time to the on the



attachment threads the seedle in two rapid, easy motions

the eye, pulling the thread in a loop with it. The kep itself is then pulled through, and threading is a feel neces-The work of this little device is so perfect, after the steple metions have leve learned, that many blind people are using the attachment. Though built principle for preingenerality only available for hand destre la idial wwing as well

The Universal Grater A MONO recent closer devices for the A honorable that have ease to our struction, the grater with intercludgealleding, its giver win insecuring, able units which is fluctured occupies a high place. Hereinfore, it has been necessary to have several different guiters of this patient in the will capitaged kitchen. The German Investor who is requestible for the present design makes one framework to the week for all, and he provides an extremely simple and rapid means of interchanging the ring units, as the picture last He also countries for the compact and rest tonge of the estire outfit is the pas the enting neater last in see re mains in place, while the other two are provincedated on the other side of the

The Quantity-Production Electric ELECTRIC touriers of each aim and ing costs table are facilitat to meet of its. The picture hereofth above the application of the many idea on a larger represent to the many special transfer reals, and in a way which probably few people other than probabilized cooks have seen. These automatic electric transfers are made with a expectly up to twenty ellow at a class. They treat with such rapidity that, in the codet mess at



West Point Military Acadesy, coast D made for 1200 codets in about half an Indic. The insoler in operated by simply investing, just about so fast on the opater out do it, the slives of broad in the she at the left. The bread is su matically carried between two elect The bread is subile, which tune it simultaneously it both widow offer which to be national. rally diwlarged late a container at the other side of the nester. The tout

The Vector-Ruling Protesctor SEVERAL years am. A F. Zehn dereniting a weter in negtitude and the standard of party order after In consent about a point in their plane. Hel frequently it is necessary to know net inequality it is becoming to make only life little of the vector, and and 20 magnitude. The mean excher, in a paper pre-excled to the Frenklin Senti-tive (Guernal, Folerage, 1924) above here this can be duty by the use of a circles parimeter and a galding straight-rige olving which it may move

The Prougless Strap Back STRAP leading that require holes to Site strap, with promps in the bookle is expain them, offer always the possi-liting that the hole will tear out, releasing the pring and splitting the load who the strop. Nazarones pringless bank! have been offered, but selden bark! nen so simple a one as that he showarded. The manipolation is



prong in very likely to stick into the Salaric or leather of the hundle, or even to calch and sear the shork dager.

The Sun Com O'NE of the inset difficult problems to be fixed its properting Assistance's remonstrated, flight arrows the North Price was the designing of some suitable seems of profession. How is the critends of profession. How is the oriethe electral less, bear in he, in the school of any reliable segs of those secti parts, to steer bie aucriste fare North! That the magnetic company used it even travel as well as its normal aerial assignish would be of little and in the plot though the kerthern ranges of the atrasphere, the following consid-cutions will serve to play: As the magnetic pale does not coincide with the prographic North Pole, the com-pose died during a flight across the Pole is bound uncomingly to shift direction, and imagnets as the declination of the needle in neetle regions is not known with anothing like sufficient accuracy,

this easif hardly in made up for. Mer-ence, the rapidly wants direction force of the magnetic needle on the plint's approach towards the magnetic Pole, to disturbance due to seveleration of the olypicae and the frequency and violence of suggestic discursars in arctir regiven, midded up even greater difficulty by the alway, may, made of any attempt in this liter a hopeless task from the very reties. Nor could a preservoir consum he said with any better chances of ma cess, this type of instrument, spart from function in the wickelty of the geographiral North Pole. The only possibility left open th would be to guide essent by the sun. In intrinsice such as our own, where the nagarity recupant works very well, the ctit of the sun on its delly recol to be be seen to be to the bestiant in about a set means of goldenes, but the seen in pulsar regions travels at practically engaged beight around the bottom.

and secretarily constitute at time!



need for the t strument about 20 continuent stated on the marking in front of the lot so as to heave the head of its ob-rive free to pretrade in an appear Specials. The pilet, previous to a ing, adjusts this instrument to course desired and sets the clocks running. For the sake of convex clockwork should be set to with line, after which the mechine is started, being steered so us to have a ministere artificial son appear all the time in a division of a freeted glass time in a common or a pressur passe plate. Towards this artificial can the plice will have to steer his course, for this invariably points the direction of his flight. Let the our shift its position to the front, to the side, or to the rear. the plict need not trouble about that, provided that the artificial man is there to show blue the way. If he wants to to show min the way. It he wants to do anothing more than the strictly need. ful, he may from time to time shock

time of the compone ricework by his own unich. As long as the two tipe-places agree with one another, he will be sure to keep his course. Whenever, se arrests of were saiden past or for sity other reason, the custor is to be altered in the scidel of the fight, he only has to turn the objective bear of the trusted through the sagle requ in ceder afterwoods again to fir teen be artificial sun The territories of the nucline is single strends. The beauts of light from the sex full on a prison which, an

to the artical height of the stm, ran be adjusted by maste of a small set-screw visible in the boad of the instrument. After being reflected from this prior the beam will pass distanced along the be recombined by an objective as other prism to form an image of the men the fronted glass plate. The objetive head, which is sengrately added able is tarned uniformly round a





mal prins tree

letten. As we the board coming smaller of the board coming smaller of the objective prime acres to keep the image of the sem supright independent of the acreal position of Old Sel. New Waterproof Gine

New Waterproof Gill
A HIGHLY water-resistant lik
A min which can be applied
the use of a het press has
been invented by A. G.
Lindsnor of the Front
Products Laberstory,

et promising advance de as a result of the g continued research the government labo-tory for a satisfactory weterproof gine for wood. The blood gines now used show considerable resis-tance to noticiture, but all require pressing in a se with steen-heated tes, which is a rein-

points, which has noted to be a second of the control of the contr

MATTERY WITH THE PROPERTY AND THE SECOND SEC

aland thin for the old-time wet be

formed fairly well. But when it came large outputs of electricity ower a part of time, it was down rapidly. Inde-all in all, this form of buttery had a w inited application.
It has remained for a French carb

as measurement or the remain extraor measurements company to take the old wet battery principle and study its short-comban following up this work with an impressed type of wet battery. The new battery, which is represented in the ac-

ments—a curbon electrode, a size elec-trode and a concentrated solution of association chloride, utilizing the cayant of the air as a depointmen. The carbon electrode in this case is entremely porons and of a cellular structure, so that it is

told poses
During the process of discharge in this
type of buttery hydrogen is given of a
tipe of buttery hydrogen is given of a
tipe of buttery hydrogen is given of a
tipe of the carbon or patient electrode,
are not be carbon or patient electrode
are the carbon of the tipe of
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carbon and presentations of the
true is a power of the
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true

voltage is thus maintained ensistent for a given rule of dicharge. It is to be bress in mind that the findels of the curbon remains for at all times. A single cell of the new hattery for expanse of deliverage way beary current roles in interactionst services, and at a interaction terrice, and at a interaction of the country or not main in in indicary control of the country or not main in indicary country of the cold of the countricities of the cell. There is at first a peak using a time of the cell of the cold of the countricities of the cell. There is at first a peak using a time of the cell of the countricities. voltage is one of the other characteristics of the cell. There is at first a peak voltage which very registly distribution of the cell of

militanperse. The carbon alement is conservatively raised at 1800 anspero-hours, or the equivalent of the life of three sites. After the first 600 or more singure hours have been obtained as indicated by budy perfected or keep size, the cell is discussed the gloss for tife, the cell is discussified the plans jur-ies washed, the fair is browned the cen-tre states and the control of the laters of these which waspe it and the bottom of the central is scraped with a piece of wased a right, following which the cell is reassectified and titled with the cell is reassectified and titled with the cell of the cell of the cell with the cell of the cell of the cell as will be made from the Elustrations, the elections are controlled in a rec-

the elements are contributed in a rec-tengular glass for the size being of ap-preciousing the same slauge as the for-lar the without top or bottom-sand the carbon element positioned within the other and properly included from it. The lovest soil is emicked by a lovery rather hard said leid at the top in the proper

had sad left at the top in the proper relation to the size by the cover through which the earhous extent allowing them across to the six in order that they may breathe excepts. The electrolyte consists of a specially propered attentions cliently are an amounter which when related with the recover covered of which mixed with the proper associat of water, will give a concentrated solution

\$10 a con expectation was bet-

called the identiscope is the investion of Victor Ernest of Cleveland, (this Mr Report who is nationally known for his work in the delection and proving of fregues has taken selven up of the fact that a plot sprayl fire the seas successful method for the repture of the

successful means, on the shown in the facige.
The identiscope, which is shown in the accompanying illustration is a novel type of cursees rightly meaned and unitarity focused. Indeed, if can accompaniestly focused. Indeed, if can be successful for united A helder reottometers by decount. Lines, it is not be opened by august a holder receites the check or alganize a formation of an entire the check or alganize and the control of an entire the first first first lines have been for the check or alganize and the check or alganize the first first lines have been for the subject to the check or alganize end as well as the subject and the neighbor product property of the check or alganize end as well as the subject and the neighbor product product of the check or alganize end as well as the subject as disparative rend and the first of the check or alganize end as well as a significant of the check or alganize end as well as a significant point for most first the check of the subject as paint they made from the magnitude and the first made from the check of the check

If a benk toller or cashler is in floube conserving a check that is presented, he can insuediately refer to this photo-graphic record and compare the face at the window and the signature on the check with an accepta-tion of the control of the control and the large true does seed by the control of the control and the course true does

and his known true nature The identiscope

The identiscope has uzzy other tose in edd tion to bank and hete pretection, such as criss nal identification indus-trial records, fraternal identification cards, and

The Last Word in Pay-Roll Protection A LL a Estans City
pay reli base to de
hereufter whin he is held
up while in the pomes up while in the possession of a large sum of an arrest sum of the front the stated her in which he is carrying the money and other valuables. The

but is uttached to a 150-feet online and the cable will be extensely ablel armored motor car waiting nee The accompanying littatration dep this het wed in pay roll er benit mas senare protection. The money and val-uables are placed in individual one

tory is available for a number of dif-ferent uses such as railway signalitie, solvebrase work, bull symptom, rails, and Your Face as Well as Your Sign ture to Protect Your Checks PROTOGRAPHIC reproduction on one I negative of both the face of the check-writer and of the check he has signed in the principle of a new marking butes which are itsected in the con-ment shown. Then such her is com-with the cutile and red. Morrow with the cable and red Memorial gover is entitled in the revolving to for the prevention and desertion of frequenty. This new desire which is with guzz ready for instant action.



rell protection. Aside from the armored and armed car, then are placed in a steel best at the end of a steel chain suble the messeager drops the box and it is pulled back into the armaned car.

overse and wellify to the frame. At the a chieffing, and else provide an nat brace. The side rolls intoler published in the new of the ladder and cache the new to work at the very but est a feeling of danger The relativess provides a place for topic e motorial for the job, and is large mould be accommodate the wicking This platfers to so what here'd. This pulled is to make drawled that half of it may be extremrenty noted in provide an auxiliary -tep alsest us extra feet in beight then the bulder is opened the working whatern and braces full into places he smily, requiring an adjustment. holder is closed up by pushing the front and over members nugitier, the braces nad placfure operating emparationing



to the legitor. There have been to

serious corridents of this sert, not to

PRESENT seed of making rope
Too the trucks of milway one me
If had as necessary for reliand rep shops to have jucks as for the user of a fitteen. In sever shaps this sort of thing is dear with ordinary hand jucks. and it is a since expensive proce-Work than that, when here or nicht cours it is gracuitt berweitt "unjust" the cut, since rules of safety number it thankvisable to leave it hanging In the air on blocking that may be d

25-947-1 TANKS

Note large alone have regular, set loose—the car being run in on a spor of track, spotted over the holes and left. Figs presentatives agone than come up-ent of the conth, to all accommences, and loos the whole cardedt up of the tracks. There are as applicable to less machine are to care, so that a heavy st-star may be specied not modify. Not sewiller sloops which camed affect and do not offen meed seat ideal outfits usy now use the pertable best, which he manufactured by a Harvey, IL, manifacture. This emoints of a portable truck carrying a succitord stool scree of stuple discusive awanted on a worm par and housed by a stronger transpart and housed by a streament trans-The projecting says or support by which the me is bodily lifted node on a broken, part invented by Watter C. Pain, a ant on the state every. Prove to really discribed, Vergints. The two Huntertoin plant by an selective most.

In the story. The whole thing—child Permaiditity is desirated by ments of a

met who backed for senting for dison



serie medianies which lifts the bore -finite up and disappears in the wal-lething nest dozen. The finite may break fast room requires only sight inches of depth space in the wall. Open the foors of the helst of the group! high enough depth space in the wall. Open the door let down the table, the two bearing, at the table. Then denotish the healthea That door, review the process, cloth the down and "there's nothing to do to ignorrow." In addition to the breakfu

fliore is a disting room which is along gile muse thing in a bit larger ender The own wheel the ten-wages or the radio set in front of the foors duri the fee and no one will then try to we

A Buby Incinerator for Waste Materials O'NE of the problems of civilization in the disposal of "town waste"—the associal though away by the bosse wife and, necessarily, taken up by the ing under term authority. Noth weath



er built with special re ore to the ladder accidents the A Ladder That Prevents Acci

donte TWENT thereint proving an killed for injured consulty to industrial shops by falls from step lighters, arpelling to accident statistics. This name her would be largely increased if figures were compiled covering accidence in houses and other places, of which no

recent our be kept. Whosever step had-dees are used there is an experience necessary hand and an experience for the applications of unfery engineering. he epplications of safety engineering. A great deal of study has been great this form of deaper with the tweel a safety ladder last been perfected. The fraces in of simplence speacy thereughly spinforced with steel. A block is in seried beyonth the step and a steel rid peried become the step and a steel radi drawn up tight to insure strength and safety. It is riskned that it is supresible for a step storagheted in this number to break loose, slip or collapse. There is a wide special between the legs which prevents the leaker from what or posetting, and enables it to straddle chibery or other obstructions ferte cun lift, pende without damper of a fall. There are





e disappearing breakfast outful in use and in repose

of the corrected policy spec-A Philadelphia contaderturer has pro-A PERSONNEL INSTRUMENTAL PROtided a special legging for the purpose of oliviating burns to the legs and fact. This legging covers the entire foot, for it is nation on the flatter pures of the foot that the maked parts gate a "Bed-foot that the maked parts gate a "Bedlook" long enough to bern or sink through to the first. They are not, we should be at to the next. You've has to consider the best first surnise, made of asbeston—the best reason for this being that is practice, ex-perioner shows that they do not have to The percenture are light in weight, tery much like the army legging, and Go and count the first or delay the spotials They hap at the back and may be put on In a fifty

In other gath must to decise at ideal potential for workups of surjour wets, but the result of this seet of effort sparing a tica, only hed for a cut The bed will perhaps seem ideal, but use even't use it. So with the men: the safety applicator treat meet the "be-num pattern" test first, and ideal as it way be, if the new den't like it, they shoply will not wear it.

The presenting legging for metal persons appears to investigated the basis autors before the action nature levi, and is now being worth fields by a large number of these worthtion. This, in the main, is simply be twise they have found it is really proc ticul and five what it is 6

to put the weight on the wheels, alle by the holet to be pulled from place to place the a small track. After being moved into position along-side the cur, a severe morecast of the uple defire leaves the hold so that its there bearing surfaces rest squarely of or tout. This build down put propiles a apfoundation or pit, but may be used on outy level floor capable of existalising the lead. No air or water libes are re-calred, the power being leverght to the held by name of a featile captering

The Folding Breakfast R The side of the board of the side of the s remain to the conception—for those a street of channe about the birthean, at least in the neutring, that makes fitting there excipated. It benefits to a simple ment water showsher than at the more forward channer table, one feels safe in 640-bit the risk of superstand for breakfast.

People who live in city upo People who are in the appare inch-case justices of every expans inch-the apartment is small it is libert true that there last spars from to do - his many bundle. Praces of this 8

er is withdrawn, the greater the or losses from the incinerator. It might seem that these poolers fre so complex as to offer no luce of lution in any would installed of table partire, jet this has been found to be the case. A literial manu-turer of large brick incidention has of savge areas incidentales and of in unalities the arthripin exoyed in these, to a small triangular mace of metal, which we imperate, the lacinerator can be packed into tall compate, and can be set up in a y few minutes by enecing the three sides and the three evener angle-irons, and knocking the two triangular hosps

down into place with a hausener. As a mample of its use, it has been found of great value in discoving of the waste great value in disposing of the waste und facilitating the auplishes in the British settlements in Gold Count; and it about the useful wherever small cummounties of civilized persons exist.

One-Man Tractor for Heavy Cab THE unrietly shape and treasmout Twight of cable roots make their heading a very difficult problem. Most

e conversed in the production or use of cable have been obliged to our ploy gange of feer or five men with ginch bare and other shaple tools to saver the reels from place to place. tion with an electric tractor with handle cable rests of any size and of any weight up to five tons, with one man. This trailer consists of a structural steel frame bravity leaved and reinforced providing an opening into which a red fits; a lifting device for reining and bolding the reel in preition; and storty wheels on which the trader and its load can be pailed by the tractor.

The motive preser for lifting the neel

The mostive power for lifting the need is supplied by a beary darty motor, drawing its power from the batteries of the tractor. When the trailier has been busined to bring the reel within the resilier frame, a shaft is placed through the center of the real caractellar over the enter of the real emerging over curved prongs, or fingers, attached to the lifting member on each side of the trailer. These lifting members are then ended by writted scews, wormdrives, from a kertherial stant consected to the matter by a silect chain and sprotech wheal. The entire control of the reellifting mechanism is so arranged that it can be handled by the tractor operator

A pumber of safety features are in crated to the control arrangement a eight and held securely the L. Automotionity operat eminen segment and the control of the country open thes are also used to prevent setting effect. The wires connect in the battery pull out in the e

og Coal with Binck I Is Dangerous DESPITE the invention of more executive such as the explosive a variation of black powder is estill used in thighing coal. Figures for 1922 issued by the Bernard of Miles alone the actio by the Bernard of Miles alone the scale of the state of the second of other explosives. PITE the in

d 1000 year of end paped in the year ST petade of permissible explinives and SI petade of high expiritors were used; an against 550 popula of the old Nack powder. A periodelile explosive is one which corresponds in all respects to the supple which has never certain

with any degree of effective consisty. diam, and what cast pining stered have welled then, that the permi register from a very more souther and a very ment reserve facur than other tests prescribed by the Foreira. This class high exploders. This is far nest in



true of the norel h des municipies plinte es

hydrated explosives, expanic nitrate re-nitaives, and certain nitra-showing existsires containing on excess of free water or carbon, and which most the requirements of the Survey's definition. Ender high explosives are classed dynamics that oil other high established the various trade single experies and personability -oris origanily men it Exactions and exactings have both short simplest religions blocks persies, becape of the rea and the unexhabitness of the total less



pi which it is restroughly much more desproves in the time any cite council indevited explosive. Miles

names and occupations excepting per-minable expiration. The third and once hely desperous class creats black product with andig quarryage, and laborers, fading that principal birete as a countrers. Die ha hangbele of the key is two small to pe mit the quick emptying of the ponds As personal unferty, the page of he and the pramptiess of emission



De pente e errieof the presention alter-rially difficult to ignite. nitrate class are ignite, and many no to born unless three will not continue to been to

metics of opening the keg with a pirk, Stallies resulting are for too course.
The overhoodnes of black blackes, pender and goo; or black blacking pender and coal duet; or black black pender and coal duet; or black black powder, gas, and cost dut, are as begards, all of which have reMaking House Models from Blue T is difficult for the average layure

visgelias his bress cremetly through the architect's binepoint draw Quate other, the finited product oks altogether different free what the owner had to mind over through the plane were explained to death and gove over carefully. This is because flat ener carefully. This is because fla drawings, do not show the neturi ser

face angle.
Wie Died Berthelessew, Mines architect, has originated a print naxied plan which prevales to recordy this orddition. Instead of showing her elected the technical and intrinsic craftenative the bectural and increase enteracts drawings. His Bertischere constructs from the bis- prints—or black prints must from the biss prints—a model of the loane. The result is a perfect solution ture of the house, enabling her client to detect and cornect objectionable features or anglement lines which he or the would be altegriber unable to detect in The root, the comice were, d palves, portiers, projecting bays, even the intelesting partiesting, any included in the model. The road can be lifted, rew the upper foor plant. Librarie, the upper foor can be removed revealing

the plane of the ground floor. The more eliminates sky future missingerstands ermination of the Place of Origin of Seed Bit in very few cases is it possible of the med the piece of its origin, a meed of most cultivated plants, look exactly silks, independent of the place of greents. For this recent, a farmer s operations beary know-

buring superior-looking seed, and ded about the automa that the crop is The an yet, and in therefore had.

A letty writer of experiments employed by the senff of the Honniest Garden of Lesingard (hotely Petrograd) had altimately to the discoursy of an infullible method of determination of the pix origin of the sent in question. This wenderful front is accomplished by sin for it is profitnelly altogether in as experts out confirm to remove the as experts out control to become use but traces of this admirature. Now it is equally well known that every region organity were known that every regists of the country has its own particular "set" of weeds, or perhaps, a certain proportion assets the different consistency which make it up. Through a constal definition of words that are with in any part of the country it be come quite possible to identify instantly any seed that course from this partic

A number of two curried out in M ees allowed not only to determine what region of the vact U. S. S. R. did the and native fivous, but his motor claims arms

What Makes the Cow Go? N this large model of a cow used by the United Stales Department of Agriculture in rability work the circulatory system is shown through means of wins, arieries and heart of rubber. An with, article, and heart of rabber. An air years is attached to the system in such a way that the heart and article pulsate noticeably at a normal raps. The heart is made of a hot water lay. One of the edgets of this visual rapids of its slaw the difference in the provides provided by various fools. The core would in designed to show how the pre-tells of the fired are broken by the digotive system into the constitute; states schia, which are transported in the blood stream to the addre, where the accessory amino acids are taken out of the blood

The new and powerful radio installation of the S.S. Paris of the French line

Keeping the Set in Shape Wiffil the cooking of the fall and long cool nights, then for radio reception, many radio extinuisant will vie with one another in the reception of distant or D. X. station. To be the proof passessor of a set that will enable its operator to have at his currented the progress of so many stations, both for and near, is the citizants goal of every beginner at this faceing-

or pastine Many small details enter into the proper care of a many to check up on these details to have the set ction unspects. Cure should be taken to see that action property. Care should be taken to me that a salanta insulators are not created or business every enabling the delicate incoming scares to be-me grounded. The lead-in wire connection should be authorit to see that curvoint has not see in the in-alty soldering, and further that the wire itself has here's waverage, and tortier to the mean and for become greenful in any way in the path to the receiving set. If the ground wire has been settented to a water pipe this connection should be examined also not say further exercised in order to insure a proper elevant from the antenna to the ground.

Next he importance ure the vacuum ches used in the set. Many a nexter falls a get antisfactory roughly became the tabes are not operating at their full efficiency. The present-day tabe amplitus a filament of special manufactures. When an excess witings above the rated capacity an excess witings above the rated capacity of the tabe is used, a sert of paralysis sets in and the tabe then needs a little sets in and the take then needs a little situation. A common way to cornect this condition is to been the financial of the take fix a period of these with the "if" bactery disconnected. The length of these populsed for this operation depends on-tirely upon the condition of the take when the fault is discovered. gits a good source of power in required right brings on to the subject of hetories. In sets operating on dry colle great care hould be taken to see that a proper often in paintuized. Tolers the fint of the tube is heated to the proper

cr. A sure check on the futberies is the use of an inexpensive solunters. As some as the voltage dress below the raced expectly of the tube it is well to er the mitage by a new set of butteries, for we offen are the ever of cirks and dier below which year the recurrent iem is not so storely. All styrupy between med pool storage below should be facilities and support care a pool storage below; should bet fire years or men. whereas if applicated the some beliefy may not had a

sterature the electronic andialon to

year.

The first item in the cure of the alongs battery is to see that the level of the electrolyte is about quecan be decreasised by somewhite the plays and health into the battery. As storage latteries often real some may the burney. As recomp naturals, often east same applicable highespen are, over should be constrained not to use a match for the purpose of determining the head of the electricity. To maintain the proper level of the electricity, distilled water should be added at frequent incorrule. Water should always be added to bring up the proper level of the electrolyte before the battery to closed on charm

of on charge. At the name indicates a storage battery is a store have the electricity. The extremt delivered to a battery

Our Radio Page

Listening-In on the Latest Progress of the Broadcasting Art

brings about certain chemical changes in the electricity and those changes came when the better; in fully changes. It is through that developed changes there are not in the change in the better; in the change in the better; but determine the continue of the change in the better; but comit in specific pareity. To test the specific pareity is professor. 100 and 100 at 100

As the heavy is decisioned in south groups of the heavy in the heavy i

A Haldert S-Hill "It" better measuring less that It with should be directed in troor of a tow one. Another important that regarding the betteries of a receiving set in to see that all connections are tightly medis. Loose or corrected enterections to said from the betteries are often the source of assequence per-resigned.

beginners at radio can be sure that their sets are aborasty of the handlesps of poor reception. To the marrayer-word their observation may mean the restreati of the original good oneittee that existed when the Static Gives Warning of Storms

A RMAL use for static has been found by the New A Tork Edgen Coupling, the exponsion that sub-ples New York City with electric light and power piles New York City with destric light and power. The static has here made to precific, extraordically, the separant of a circulamenter. These socious thanderscene are always framed by power-brane superfurnedment. When one of these knows up the sky grows actioned better. This makes many people turn on the electric lights all at once. The result is a solidate decard on the power-brane for ment is a solidate decard on the power-brane for more power; a fermind that it is not always easy to need. Admice warning of an approaching stress in a next accessory that to the prest city power companies and were of chest have seen peas so that as to provide their own weather service so that they would be some bright news as long about an procedule.

The plan werized out at the Waterside Bittlen of the Edison Company is simpler. A ratio assess is excelled and connected to a otherer, some ridays and a bell. When there is existle in the air from a diseast shoot its appendix collects energy and every other its whin the bell ritags. As the storm drawn passer is New York, the shalle given extrager, more energy is

Microwa.

Thus, when the engineer is charge of the photoe hears the static bell ringing more and offers he knows that a storm is on the way. If fire up now beliefs and get roady for it.

New Antenna for "Beam System" B New Antenna for "Beam Systems": I person separation of a bound of ratio waves it has been extended as a reflective composed of whose avantaged in it of a periodic, due transmitter being beautiful properties of the periodic, that the large in it is provided to the composition of the large in it was the method used in the experiments when your or on any as of the United Research or soft, as well as in the experiments which forced deconsacted some incoming and other new large in the composition of Buildo Engineers and other new Beautiful Property, Mr. O. S. Pranklin, of the Beautiful Property, Mr. O. S. Pranklin, of

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24-Pube Receiver Built to Listen to Mace THE Technical Editor of the Landon radio we Popular Wireless, built recently a receiver cents. expected, to such signals were rec-broadcasting was heard on a small sting of anything at all on a re-d as this ope must be cointineed at. Rafin time will swith with a set just how the hoolesty was just

The Heavens in November, 1924

Various Topics of Interest from a Month of Meetings

By Professor Henry Norris Russell, Ph.D.

IR PAST switch has been marked by note-worthy selectific pickerings—free among them the great meeting of the Hellich Assotion for the Advancement of Science Direction, Much material of the great at Trector. Note hastered of the general control of the present in highest was presented on the same of the second of which the hast select quicked in these citraria last meant. Moreon may be used, herever, of highest meant, become may be used, herever, of highest second of the last period of the second part of the second of the second

prior measure provided in the state of states.

The smaller possible of the American Astronomical schedy, at Darmouch College, breight out none within so limited range of these columns. Many of the papers, I course, were almost entirely of net-

course, were alread entirely of sel-ingli interest—such as those on the small spigmatch observations which must be up-side to observations of various serie; at the results, even of these, are of gen-nal interest, for it is only after such exercises have been applied that we can must our results for the distances of the must our results for the distances of the smelt and select appears that we can appear that we can appear that where the content Dr. R. R. Willess, at the Ducker work of the content Dr. R. R. Willess, at the Ducker was the content Dr. R. R. Willess, at the Ducker was the content of the state of spectral often the several content of afforciation the state of spectral of afforciation at they state over a wide its area of all brightness, from about 200 to 2

is possible that the particles composing a spiral arms may, after all, be needing other greatisticant forces, and returning interests to the vicinity of the nucleus, worlded that their orbits are an armanged at the outgoing particles chance along a arms, while the returning once are ittered more at random, and hence are a conspicuous. The mechanistical de-ia of the investigation will be awaited

St. John and Rabcock, from Mouni Visco, gave details of their investigation course in the man's simmaphere, at all spectral lines are shifted to the red when they are produced ward the red when they are produced. At it wishes under pressure—and some more than others. By comparing notably chosen, groups of they with large and small shifts, the pressure prevailing in the son's attouchers about the pressure prevailing in the son's attouchers about the pressure prevailing in the son's attouchers as in too others the control of the son's attouchers been in receival and the first and of the control of the control of the time receival and the first and of the control of the c

secure to encountries. The video is out of our to the process of t

very lowest visible lends are awarding. A properties very aware value seems are accreting. A comparison paper by 81, 3-61 and Additive extends the same notificide to several of the brighter stars, and shows that the popularies in the atmospheric of Sintes, Procysis and Accreting see and love-40, fair, two of the three values Arrivan are all low-th fact, two of the three values ones out negative, though to more than the error of observation. The stable regions of these man, ton-must be excepted of gaves of very low founds; If appears also that the describing corrects of cooling and at a high level, and the severating beard courses at a low level, gaves more rapidly in the hotter stars, which

Planetary Temperatures Perhaps the greatest pro-rul interest, however, atments of the lives redistri lactive to certain measurements of the less redisted by the planets. Petit and Nicholson, at Mount Wilson, have applied their themsophe to Votas, when the

planet appeared as a thin crewood; using a soull heat which present hat a fraction of the plane?

At Fig elektri Kontaker 10. NIGHT SKY: NOVEMBER AND DECEMBER

get less, not only from the bright side of the planet, but from the whole of the dark brainstern too. The further is carried scalinly by the reducted auxiliate; the letter cost represent best stored by the pictor's sur-face and re-radiated. When the referred energy is represent (which can be don- by interposing a seven or glass or water, transparent to it and operat to the roat, it is found that the white nurious of the planet, on the smilt and dark sides, is of about the same treene in verse and dark ages, to or from the series of the personnel which comes out just below sore, on our freelitar Palmenholt make. This aways surrounded to have but in not far from what might be expected for a plane which receives the suris hast, at Vetur dis-later, on one side, reflects away 60 per cent of 11 (see Venus does), and gets rid of the rest by rediction from the whole surface

Two important conclusions follow: first, that the Two important contrastine follow: fact, that the plant can hardy keep the areas from remed the returning of the fact that would almost some be very old follows. Supportungels above that the fact that would almost some be very old follows. Supportungels above that the fact of the fact that we would be contrasted in the second of the fact that the fact that follows the fact with returning the fact of the fact saids from cooling very fac. Second, if the temportune at the definite serface when the fact that the fact th

is so kee, the absence of any considerable assembly of water vapor in the atmosphere above it is considered, with the existence of water (or perhaps lee) upon the planets surface. The new data still appear to support the the they that the visible surface of Venes condute of chests, like our high circus clouds, composed of fine inverty state; but further studies, which are doubt in progress, will be engerly awaited. While Venus thus appears to be cold. Mans, accor-

to a profesioary concessination from Coblem's a to a preference reasonate trees concerns asso Lamphon in the Lowell Cheervatory, is wanter that previously supposed. The methods of observation are the same as for Venue, and about d lead, when the year's work is fittined, to reliable values. The observation where refrite from mentioning may figures for temperature till their work is completed.

The Regress The winter constellations have ret-

In all their givey. Orion biness in the scatheast, with Taurus above and Canis Major below. To the left of three are Copie Minor, Gental and Auries; with Progress above the last and almost overhead. The two Bears and the Dragon are all low to the north, with Candoptia and Orphras above the Oygles and Lyra are low in the port west, Pegaran high in the west, and Andraweds to the senith. Aquarius and th Southern Flah are in the southwest, and Cetus and Erifatus occupy the great dail region to the work.

> Mercury is no evocing eter all this mentioned first two gener the sun to be observed, and so for south, even at the last, that he sets at 5:30 P. M., and is

wery hard to see.

Vestes be a secretag star to Vitgo, ris-big at 2:10 A. M. on the lat. and 4:00 A. M. on the 21st. She is very con-

screen. More is capidly lesting his glory, and is twice as far away as he was in August. busy answering inquirers who want know his distance and other things about

him. But he is still brighter than any other star save Sirius, and is the prinadornment of the constraint is an enting star, setting at T-00 P. M. on the lat, and lost in the rwilight before the month chain Saturn

is a morning star, but too near the sun to be seen till the stad of the routh, when he rises at 4:00 A. M. Uranga is in Places and observable all the evening. On the 12th he is 34 salutes north of Mars. and may be seen with a good glass, in Les and comes tate quefrature west of the sun

to. The most is in her that quarter at 5 P. M. on the 54, full at 7 A. M. on the 11th, in her had goarter at 1 P. M. on the 18th, and new at two on the 28th. She is negret the earth on the 27th, and further away on the 14th. During the month she puses year Mars on the 5th, Pengas on the 6th, Neptune on the 19th, Venga on the 194, Naturn on the 24th, and Mercary and Justice, close together, on the 27th. Neptune is occulted at his emissection, but the planet is so feight that his disappearance mould be very hard to see, even with the largest telescope. Harr is also occulted up the feb. les the abstracement is visible in Burrow and not here

Astronomy and Radio

All STEEL agreement who are also interested us madio our invited to participate as exercisiobservers in the Scientific Augustan's apprehinging of the asker enligher next Jonesery. fired the setter and description of the test, published on exciter page of this issue and ered the information submit for to the Relieur Edutor.

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American have learned to depend on the telephone, in fact weather or in foul, for the usual afface of the day or for the direemergency in the dead of might. In continuous service is taken as

a matter of course.

The marved of it is that the militons of thread-like were are kept alree and ready to wheath at one's sightent breath. A few drops of water is a cable, a featly connection in the were mane of a neutritioned, a vocient sleet, rate or ward sterm or the mere falling of a leastly will often resourced the service.

Every duanel far the speech currents must be kept electrically intect. The task is an ordine as houselesseng. Importion of oppositude, exceptioned and all parts of the plant is import on all time. Were choft at "into boards" locate tookle on the weat toogh rules weay. Requirem, the "boable hastness," are at work constantly wherever they are needed in only streets, canader reads on in the electron-tender took of the widelenees.

Providing telephone service for this great nation is a high sadder taking. To keep this visit mechanism always electrically alive and depostable in the unesting task of tens of thousands of shillful menand visiting in every state; in the Union.



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from the operation of machinery equipped with Timken Tapered Roller

The National Acme Company says:

"The use of Timken Tapered Roller Bearings for both front and rear of the spindles in the new NAM-CO Semi-Automatic Six Spindle Driller, not only takes end and radial loads, but reduces friction, requires fewer parts, and, in addition, provides an increase of fully 100 per cent in spindle speed."

There's a production story The Chisholm-Moore Company

-made a test of the Matchless Adjustable Overhead Trolley, the wheels of which are mounted on Timken Bearings. One ton was suspended from the trolley. It was found that a pull of only fourteen pounds was sufficient to move the trolley and its load. This test should interest the builders and users of material handling equipment for it proves Timken power saving.

The Cleveland Armature Works

-manufactures polishers, the main shafts of which are mounted on Timken Bearings. Six of these machines have been in operation at 3600 R. P. M. an average of eighteen hours a day over a period of two years polishing bumper cross bars. To date this equipment has not occasioned a moment's delay in production and the bearings are as good as new. That is Timken reliability.

Whether You Build or Buy

-Timken economy, durability and trouble-free performance should interest you. If you build industrial equipment, the installation of Timken Bearings will bring greater sales possibilities. If you purchase industrial equipment, bear in mind, Timken equipped machinery pays larger profits through increased production and lowered production costs.

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IN the manufacture of telephones, switchboards and telephone cable, Western Electric looks to the mines of Missouri for millions of pounds of lead each year.

These great shipments, in combination with other metals, are put to a variety of uses ranging from the little daise of solder on the terminals of cords inside your telephone to the heavy protective covering on the miles of telephone cable over which you talk.

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General Motors Trucks



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From gold to glass

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Gold, platmum, diamonds and tungsten, iron, steel, copper, tin and zinc; coal, clay, cement, sand, gravel and lime; grease, oil and chemicals, cotton, nute, hair and leather, lumber and glass.

The leather used in a year would cover 150 city blocks, the lumber would build homes for 50,000 people, the steel would furnish the framework of 16 Woolworth Buildings

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large economies in your plant.

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The Smith Gas Engineering Co. Dayton, Okio

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company to the place of the shiften as well."



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Power economy recommends the high speed "prime mover"-the electric motor. And power economy recommends the unit drive-a motor to its machine.

But many machines-conveyors, elevators, agitators, screens-require a slow drive.

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To the Business Man with a Building Project before him.we introduce

But Weyerheuser did make the most exhaustive study of this type of building in recent years—and perhaps over.

Weyerhaeuser went into o Weyerhouser went into capital investment—taxes—interest charges—depreciation—
design—structural efficiency—
fexibility of interior division
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and many more things.

and many more things.

And Weyerhacuser has put
its findings into two books, one,
"Industrial Buildings," for the
Business Man; the other,
"Structural Timbers of Doug-las Fir," for the Building Engineer, Architect and Purchas-

Weverhaeuser-Ideal Industrial Construction

EVERY once in a while the human race makes prog-ress by going lack to a thing that folks thought was "out of style."

This is what American man-facturers are doing today tout their factories and ware-

Many are frank enough to say that in the past they have "put up too much building." And when they build again ings will be different.

More through investigation of the facts beforehand. More money left over for operating cash when the job is done.

Probably 50% of the pro-posed industrial building in 1924 can make use of Weyerhacuser Ideal Mill Construction to a large and definite advantage. Weyerhaeuser can tell you— and prove it—that such asvings as the following are quite pos-sible:

Save 15% on capital building

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In one section of this country, there are hundreds of great mills built of Mill Construction, and protected by the sprinkler system against inside fires, on

which the losses from fire over a recent three-year period have averaged only 3% creats for \$100,000 of insurance surities. Weyerhacuser did not origi-tated the control of the control o

One of the stock arguments against Mill Construction was the insidious whisper that "you can't get the good timbers any more."

Weyerhacuser can tell you that this ian't true, either. It seer has been true. Weyerhaeuser has studied its own timber resources and dis-tributing facilities in relation to Mill Construction needs.

The Douglas Fir Mills of the Weyerhauser organization are producing selected timber of the finest possible wood for Mill Construction needs.

Through the Weyerbaeuser distributing plants in the heart of Eastern and Mid-Western markets, these timbers are laid down quickly and economically without charge, on request from responsible members of indus-trial concerns.

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Adhesive from the Soya Bean THE law for an adamine is obtained Then some beats or the seeds of ther leganizes plants, by treating the beam of seeds so so to focus a liquid scale ones from which the field is expair mase from which the find is ex-racted by present. In this way the oil to separated from the bean and is taked with the field. The best step is to require it from the latter. Then the revidual liquid to cardied and the curd is separated, dried and pendered. This forms the laws of adhesive respectives.

Alternatively the lightly poly mass itwell may be cardied ofter extracting the
ell from it. The card may be treated es as to extract any acid present before it is fixed. The wintim of the extracted her may be responsed with action

fanganese Deposits in Java NINCATIONS of nedgators on law less discovered in the Besidency. a new (necesser) is the factority, liphtplants (Jura) over an urra of tearly two miles. It is undestability a sedimentary deposit, and the layer has an average chickness of from three to ingrand a half first, increasing in places to five and our-half first. In the lower hed of the soun products has been autopiones, legi the upper hed in the en pure. He existating, an expert preduct can be made with the per over suggestions. Mangagerer are also cover in the take districts of Oriotee. These are highly

ferragions, and so energies shows 193 are cost less by berning, 3.40 per rept NIL, 42.00 per cent Festi, 24.00 per cent of Majo, 1.18 per cent of NO and 0.46 per cent of Crip. Uses of Anhydrite

A NITTUITE is a school which of-curs in conditrollo quantiles in nerica peris of the centry. It is socily found in groom wines and at usually found in gryssus whose said at the present time it is practically a wash-material. It is expected, however, that the limens of Milita is bought land? with experimental work to determine the services of this product. It is felt that the inflament has perfure some as a substitute for gryssus in the maintaintener of perfusion greater.

Manganese and Plant Growth CHREATN elements that occur only in tery meal amounts in plant theree would appear to play more defails part in the rectang of the plant. According in the eccusions of the plant. According to the Journal of Agricultural Excitage (1) Tollars 24, pages 281, 194, as investigation between this test best made to determine the first of assignment militate on the possible of plants in water cultures with a possible purified surject with The test for wells. In the latter case ex-periments which were carried on for too short a time failed to reveal the essential number of the manganess. The look of manganess afters the that mangazone estitute applied to an soil counsel a decrease in cree, where if calcium carbonets were applied addition to nectralize the soldity it excess of nanagazone suifate rea sell there or less startle with r

Improving Odor of Whale Oil TO improve the odor of whole oil, th latter is troubed with frenchisty neer may be overpostable with softent frontide and existing hydroxide in water to give an attenday proparation. This powers is parented in British Patent No. 20099. It is advisable to add a little relaters wild to the oil while it is undergoth the housidehole treatment. The area tie broaddebyde treatment. The pension out at the economy tra-pension or if the intrare of oil and formulatelyde is heated postly for a pen-leaged time while being constantly ag-tared. The additional produces, which the formulatelyde names, settle to the holconstitute some of the impurities wind give the ctl its and oder. The excess formal@rbyde is then reserved by pass formularbode is then convenient in its flowest a correct steam or by influence of various catellalar age. inflorery of various calcising. This process is patrented in Occu-rat. No. 192250.

> THERE has been much controvered sice for paper. Some antisection has argued that it is very waitable, stre sales and generally improving peop on the paper in which it is used. The lished in the toursel. Paper, which stee a institution of a report of certain wed performed by two Datch checkets in the governmental beding laboratory. The conclusion received was that the introduction of sensil proportions of rather lates into the beater with the pulp served to increase the strength of the paper made from the pulp. About three per cent of robber lates appears to give antisfactory results. A comout was also made of the scane pro-orties of rubber letex to comparison w To was found that rub route also. It was found that rubbe later is not so med a sister agent as

Rubber Latex in Sizing Paper

Non-Crystellizable Syrup CANE correy as now produced by varieties of super case, and od sprays rick in section frequently of sprays rich it success frequently on take so large a properties of success that more so less success separates in the from of crystals in the gyray of standing after cooling. The presence of such stage in the gyray labors mate-rially its connected value.

riculture has found that he either fresh or air-draud he to interest a portion of the ma-in the syrup, the success he reduced enticlently so the of crystals foun and occur. I illustrate a property of the femality to which the finish-reduced, and with the su-strongs of the friends -produced, and with the su-strongs of the friends -

IKELY as not you'd sav "it's wood" when asked what a piano-

action is made of. Now you know that it is will. Same with the neat, flat platter you cut your bread on. It's ME. Play checkers? They're . So are tubs. So are tooth-picks, & steering-wheels on good autos. And good auto bodies. Also railway ties. REE, everybody's everyday good wood. sure enough. Can you guess the 148 other vital & artistic applications of me, that World-standard "105%" hardwood?"Let's find out?"

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Specific Heat or Coal and Composition

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Chemiand, Ohio



Light is the best policeman



Many cities have proved it. Summing up the results of better lighting in Cleveland's been made in the lighting."

downtown district, an authority says: "Crimes in this district in the year 1916 were but little more than onehalf (59%) what we might well have expected had no change Yet the cost of the best street

lighting averages less than 9% of the total of a city's taxes.

GENERAL ELECTRIC













A storm is about to break over the city. In every office and home e get up and turn on electric lights. omerwhore the nower plant must y electricity up to its capacity. But ro of the generators are running. takes time to put the others in ion. Where is the additional elec-

turns to lead for sid. In the re plant an electrician theore a ch that turns on the current from y storage batteries. These batteries, a mostly of lead, provide the extra

Millions of rounds of lead used Lead is serving you in storage batteries everywhere. At home, on trips by land

nd sea or through the air, in peace and az, these lead betteries have become ential part of the nation's life—the e of each of us. Storage batteries in this country in see in radio sits, automobiles and cro-tral station power plants alone contain

ny millions of pounds of lead. The ount of lead used in a ringle storage tory ranges from a few pounds in the slicet to several hundred thousand ds in the largest battery. What's inside the storage battery?

Each lead storage battery is an electrivoir storing up energy for the time ed. Inside are two sets of lead grids, th litharge. These plates are imme a a weak solution of sulphuric acid. hile the smaller sizes of storage but are contained in glass ja er jars, the large central at are installed in immens

on proteons in millions of automobi They aumily current for the ignition systems of tractors on many of the 6,000,000 or more farms in the country and gas trucks in every part of the land.

Load at one and in the air

For yacht lighting and for motor-boat ighting and ignition, storage batteries again come to man's assistance. They supply current for turning turnets, sight ing and firing goes on warships. They propel submarines when the underses

Load in point Lead aids man faithfully and well in the ey. But it serves him more

Red-lead, another lead pigment, is the standard paint for metal to protect it against the attacks of rust. You see red-lead everywhere oz akystraper skeletora, bridges, gus tanks, shipe,

surface and hence the entire structu from rapid deterioration and eventual

Producers of lead products

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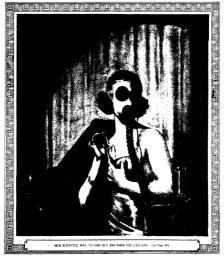
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be arranged for effort thee, mean use one take, others no right or feel Prices name from less than filters dellars to a thousand dellars or more. The particular art that were regit to law deper on what you want, where you are and bow much you want to spend. The only way to tell you is to give you the essettial facts and let we choose for turnell. We will print next much a list of all we was press seet maters in the color American serie the quality of which we approve seith full information about each The information is now being collected and tabulated. Sets unknown he as are and tabulated. Sets utdenses he are are being tested. This inducestion, kept con-tinually up to date, will run regularly in the Scherman Assessan during the will-ter months. It will be a bayers' guide for the radio fun abo wants to buy a set rether then to bottle one.

reflect than to both one.

In the present lease radio fans will be binned in the netter of Mr. Stanley and Dr. Sheiban on page 881. Radio methods have been used to help those remarkable new teets for stagers. On page 301 is Mr. Delany's description of the famous Helmack cabe. With it we grid. the first laboratory photograph of Profis-sor Holwest which he has allowed to be ace Howest which to him allowed to be made. In Mr. Leneurhousu's radio page for this mouth (page 390) are the latest switching in loadsmarkers.

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Mentulally my print in this loan, or near 761 on compart of terms propertially page 382, an account of some remarkable and apparetions personal experience. In the Chairman of our Popolity Constitles

IN the Newscher lease we assumed our radio investigation of the sole evigue, to 51 January - Abother sensemers

seventi loca Many sproisests of persons loan. Many servinests of interiors have already came in Thora in nous for more, reportedly in the Middle Wretern States and in New England. Turn to page 388 and would in your nelessis today Conversities in this investigation is a consulting of the American Astronomical

Nortety, headed by Prolesses E. W. Nrown, the emiseral subretuner of Yale Dalverthe eminent redromaner of Yate Curver, lik counties dealers also that certain inperior electrolists be under by the geteral public.

One of the foliage to be observed in the

exact time of the ceities. Another is the Mill ender is the phenomens of "dander bands," the stripe of light and dark that slave such other along in ad-399 value of the ecline time observes, rest If they are not trained astronouses, cal do trail work for extract by observing they things and posential what they see Exact Instruction will be bested to Professor Down's consultion. We will resided, these in full to the Jacquety been of the Scharman Avenues, are Decemher 20. If you are not a subserfler you meetic a copy for bea, or send no thirty the even and tell us to next you stell

> UIE suggested outcome rare in Paris Till appeared called on the page his match, has not about up under the page. ing investigation of our Paris, represents tore. We do bel mean that it is frough But it is not set been, not yet-Perhaps it may be some that In the negative we will continue watch the progress of the experiments Who there are managements

OUT of the sands of the northern own of Africa, the some sands the englished to the rates of the one area city of Carriage, tiers are diggler the of Leptis Magna, Nithphov and home 357 of this leave we pulst pleatographs of were of the remarkable rates that have been messeed. The descriptor test has less reproced reportally for the Scatte

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THE MONTHLY JOURNAL OF PRACTICAL INFORMATION

NEW YORK, DECEMBER, 1924 Scientific Tests for Good and Bad Singers

A Description of New Research on Methods of Determining the Characteristics and Possible Development of Singers Voices

> By Douglas Stanley, M.S. and H. H. Sheldon, Ph.D. New York University

SETHERE the value of a prospective single has u cleary of developing sufficiently to justify the expense and labor of training it is a problem that must be fixed by the consolections singing moches every them that a new pupil presents binned. The

that a new pauli (execute bisself. The assert is, necessity, a native of gamework. Keen a maxiciar' (edgeneric of the quality of a well-entance of the department of the quality of a well-entance. This against may be based on while experience and it may be right. Substairty, the experience that the part of he ability to do this resides a large part of his special

But It resid be better, every teacher will admit, if it were possible to do those things in some definite and measurable way; if we present some instrument our able of detectains the characteristics of a vote with se great previous, for example, on the instruments of the availet are able to determine the elumenteristics the aculist are take to determine the clustariestation of yary sps. Even more suggestly needed, from the teacher's standpoint at least. In some way of determining with welcule accuracy last what is that in the smaller with a given valve and just what it is that in the dome, adjustedly or physiologically, in remote the impactations that entire traperfections that exists a sixtee for account of the property of the property of the standard part of the property of the standard part of the property of the standard part of the standar Slaging is ownerlially a physical set, quite on much or as seeing. Yet the science of physics has much important contributions to the study and important

ingurant exteriorities to the study and improvement of the larguar eye and practically none to the study of the singing toley. It has seened to us that there is an important apportantly here for methal physical in-vegingations and the experiments now reported are oded as a first stee in this direction.

The findamental set performed in singing is the expansion of limits fines the large. This health is forced through a source specing letween the two word codes in the threat, protecting a luminosity or similar toley. This mode is madified by measures in the all-filled passages in the local, theret and clean and consis-

cut as the sung tupe. ent as the sang time.

In attacking this matter from the vice-point of the advance of physics it would be possible to study by physical methods must different asympton of the operation of tone positection. Indeed it endoubtedly will be accounty to study all lower appeals before reference with three endousted the subject. Not to make a beginning here exhausted the early-re. Full is savie a beginning and to do not in a sufficiently simply very in several bast to savily saving simply very in several bast to saving only one florare of the value production, namely, the expension of the beautient. This is necessity to exclude the control of the contro

proper training of a votes.

The propert study lactacled, therefore, a moved of the amount of breath expedied per second in the singing to ansette of organ expense for second in the singing of a tone, so conquered with the plints and the bestores of the lette wing. These moveds were made, also, with of the lette size. These exceeds were units, also, with a number of singers; ware until trained, others, almost without training. It is possible, therefore, to deduce a number of conclusions also the arrian of the breath in the possibilities of wate totax of different relativistics. and about how this new of the breath map were to and alrest how tree nor on the neutri way sever or indicate fugits of singlest technique and, in some coses, the breach expelled and smeller drider to tempere

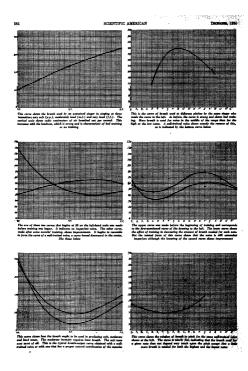
The breath-remountar device-called a gr to retracted to a large railer rate which leads, to turn, to a railer must strayed tightly over the singer's face. The other end of this tabe discharges undersech a light, afetigte box issuered in a tank of water. A two-way flatter water in the tube allows air

to be breathed in from the room in the tage in our in the breathed in from the room int coupels all out mind with a pass through the table and late the inverted inc. The gradual ties of this ben as it this veried lot. The gradual rise of this lot us it fills with air and flows higher and higher is the vater gives a measure of the assessed of hersile expedient. In more of our variety experiences the rise of this he, was received by a lover aspects by which a given has neverthed by a lever system by which a sharp path was presend on the satisfact of anothed paper of a resoluting draw, where it establish is like as the box of the spinnesser new This method was admissioned because of the four that errors were being introduced by the frields of the sharp point on the paper. As a substitute on cetical states not a remard. A setal apet of light non foreveed on a solver featured to the less. As the less rises this light-spot traces a like on 6 man, As the left reserving was dised phringuishing about a tacking about of reportedly was dised Conquery. From this liter it is morehly to read off the court amount of brests expelled each second in the singing of a specified

a special triophene transmitter inverted in our of the in special integlates (reinseather lateried in one of the symbols of the unrit worth by the slager. Proc this integlates the rivolated impulses corresponding to the sound produced our personl through a special implifier, shaller to the implifiers used in raths, and these to on increased called an ordingraph, which is a desi-

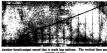












leady, a very efficient method. We find that it actually is so, for these investigations above that the moderated lead notes are produced with too air than one note of any other insteady. This is typified by the lower left-hand cures of page 582.

On the other hand, if the note being stag is a se

ds on mosting photographic files the exact and intensity of the sound waves produced mask. The telephone and amplifier, both to be as free as possible from my tende obligation in the state of the phase of the state of the y or distret the tens, were supplied by the Meetric Coursesy. The oscillagraph was sup-

"Petativation," mentating very writ. On the right-hand curries, which give the relation of breath-curries is plich, the different plickes are designated in the muni-session seession, the higher-pitched socce being at the right of the curries. The vertical scale, in all custo-inglesses the amount of breath emitted, resonanced in

Indicators the anomal of herein restitute, measured in reduce confinence per sevende. Any play and curses in the determination of all the class-restricts of a suggest-wise by same of the characteristics on the determina-wise by same of the characteristics on the determina-tion of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of t sext; and the soft one the least breach of all.
This scene spite at it should be but as a matter of
fact it is wrong. This shape was not well trained.
The rater was not perfect, even from the magnitude
viewpoint. Tota made during this investigation have
slower, quite definitely, that the breach cutyet of a
well-trained wice does not have this shape of cutyet of or well-trained wien does not have this stage of curve at all but has intend the slage of the curve in the lower side hand corner in the lower had been decreed by page 262. With well-trained stages the posterior of a soft tree actually requires more levesh than the production of societarity loss from or leves, in post cases, or very look of some or even, in post cases, or very look of stage or leves, in post cases, or very look of stages of tree for the look of the look of

times is left quite circle, as it is in normal breathins when no speech sound is being professed. In home of this that contains many different statistic professed which disputies. The thing that causes a obtain an airson important. The thing that causes a obtain and presents to be needed to the restance in the speamage of the threat and in the back of the causi-pant door. The is what it is resourced to after it. been how to control very provincy, not only the ma-that more the word conds but also the many muthat determine the exact stages and stage of all the threat passages, as well as the unfable-stard passages of the back part of the mouth and the back part of the

The roral cords also operate to control the leadants of the test. If the original bars of the word rords is but freetance conflicts being correct), the sun

tree will be lead: If the loss is well, the ease tree will be set. Therefore, when we mudy the relation of rise amount of breath used to the long-term of the tree-we are really studying, in the main, the behavior of the trackl confe Response that a single legion to sing a tree settly and gradually smalls it in leaders, keeping the pitch and worst stickningsd. How the pitch and novel scool do not change we know that the shapes and there of the residualing cardian recents unabserd. What does change is that as the tone grown loader the vocal credare brought closer and elever together. At the natural valor industry, corresponding to a nationality load or "mil" note, the cools will be practically touching. The uir will pass through their to a series of polit, the producing the iron of the roots. This will be obve-

on the other hand. If the note being stage is a settlen as the local conts will be farther spert. The is will pease over them with a booking effect, like the effect wind blowing through a fairly large coast. The will not be an off-their method of sound broductie will her be an eithern method of some production More air will be required to make any noise at all. This is the explanation of the apparent paradox estab-lished by these experiments—the paradox has it takes hash more breath to sing a soft tone than in our para-

lead etc.

If why is this not true with all stages? Why do uncertaint or hardy tentant values full in older this uncertaint or hardy tentant values full in older this great the property of t belows no that they would like two different wides.
With preper training this difference disappears as the regulator receitable perfectly. The blooking has been been paint of the wide prince.
The same applies between the "topes" and "dwell wides of a worse, the lever wide being capable extended as red dwell wides of a worse, the lever wide being capable or extended user the entitle starp for a local start.
Contentry as it his the two self-subtions of strategies of the treath of the two-self-paints in distance enterly the way sale may be street fashers and vanishing principal. less the "civer" soles, with no break between these So completely in this true that the great degree, wis lappes to possess balarally the equipment wi seggies only by proper training, are some laste that there are no such things as registers. more than so indirection of improper coordination an lack of development arrows the remotes that of

the woull creds. The transition from one register to the other—from the fasterto to the chees—favoires the moutes the state the two cords and being then closer inguiter. There are three acts of them intodes; two, in particular, that have to do with the constant of the cord. The day with, as set of mostion productions. The day with, as set of mostion productions. well the tene the other set of names

well the tens the effect of of statements to break as more and mater his pile; as such a school in historic Threefor if his wise is, as such a school in historic Threefor if his well as the second of the product of the school in the beginning such as of the weak-red associe in the beginning such as on as of the weak-red associe in the beginning and product in the action of the school in the beginning and an advantage of the school in the beginning and a such as the school in the school i





ther sacilisgraph record which is much less regular in the of the vibrato peaks, indicating a voice that is less perfe



Experiences Which I Cannot Explain Away

Reserve and recording officer and associate editor of the Associate Society for Provident Stewarts and Chair

Are the Observations of This Noted Investigator Explainable by Mental Telepathy? By Walter Franklin Prince, Ph.D.

parent of populated research records three types of mind-that dominated by the will to believe, that showed by the will be didullers, and that which lacks say rather predisposition thus to deterease the facts. A fenerite discus of times swaters the will be disbelless to that every person who becomes large eridency revealing to favor the occurrence of the superbenul is desirated by the will to believe Scientific Assertant leving used me for a suscenses of the abenevita with which I have come in contact and which have impressed on as worth; of provisional and which had dispressed on an world; of provincial acceptance—or which, if you perfor, this was fire as fitspoolible of rejection on the face of the coldence—1 may neckets be repetied on the face of the extendergraphical details which are referrant obly its so far an or tond to proget up of this will to be too credishout out any heat tongot provident presents from a childs produce for mixing pursues of all kindmedanical mathematics, verial, literary, and dealerst headwriting regaged my attention and panies, questions delated for decades or centuries have made original researches into the blue laws of New England and the early criminal code of Virginia. need directly contradictors in what had been believed for many years to represent the force. These force one not remarkable but they realify, perhaps, to the allester of a will to believe, to the pressur of a questioning

When I was first attracted to the phenomena of policial research, it was most emploritedly and with desire to accept their. When a very years must fi aght spiritualism with order. I was still indused a dealer to severe there. a dealer to accept could, when it way young that a fought spiritualism with order. I was will imbeed with the belief that arisen land marked out the last begging of the preside. At this time I shared in the tudes, which many people still curry to their graves stypics, which many people stat curry so have graves, at the field of paychic plemaners occisioned nothing one people than the average senters in a darketed more perpending than the average section in a caregine room or the usual public test because. But as I pured the subject, I found massed ever and signin ex-cepted by puzzles which the most careful and per-sucious study did not solve on any normal basis. Of I are still encountering constantly cases of

proves (independent writing for equation) which seen to me unapported by instructing estimate. Others arming which I can the psychic photography, seen to superlatively doubtful. But there are other varieties of payotic experience which have refused, chall-hately and introducingly, to be thus disposed of. They entainedly present themselves in such faction that have not found any silvensitive to their acceptance. the set popol any antennants to men acceptance.

One such category is the plenoments of appendix negoting. I had lived in twenty-six house with an words or appting rise to come perpinalty. Notice caped by weather, Nean pipes, rate and mire, inserts, what and the like are all families and all seein inserts. to their source. With my wife and doughter Theodolo, I moved to my remineerenth larger, he ented in the middle of a large lawn on a quiet screet. Nine odd and unexploited things happened during at these years' residence in this impair events become The mp pheterosts special with a grand display at a hight when Theodods and I were given in the house. Thire she arms and munded the bress, thinking that were living percent or annual was moving about. At unit sweales, while she shop. Liniming in the durk in the two corners of the mean appealse the court if leard womin much like the frequing of a wounded bird With the light on no hird was there. The sum round when I went to the spot. At length the light, fity perceditar; a press with very arete bearing right have detected many more. What comed them? The girl was in the other side of the more and real? tests left to doubt as to the location of the notation

After that remains the nips were heard frequest both by day and by night, chiefy the latter. Updates and down, in this even and that, in derives and in light, when any one or two or all three of the family ngue, when any one or two or all times of the manny wave present the man construct. Hence southly mann in the plane but there was no described of any hote to indicate a sinchesing of the when. Eags came apparently upon the Rule table close to my bed in the Notes where I single sheet. Raps were heard by diff pressure in different parts of the boom at approxima-

of marks. Her read on

the same time. Hope came directly in front of me, on my fineer, as I stood beside it alone in the morning. enclase for rape were startingly lead.

During a period when I was giving Sunday address. me of their sunnik errarred on Naturday nigh Edd the rate or fawers desire to preter my rest? when or what was this intelligent interest above? was not directly by the fixing persons in the house, the I have no enested, note that I failed entirely to fast or guess any normal range. Choose your own solution Force proceeding free our hodies and directed by the

enterperiors rotal of sensents to the brase; spi A few meets after the commencement of the rape in this home similar immerities wounds began in my this home similar nighterious wounds began in my affire. Generally they secured to be on or it desix. Seating always they occurred when I was almo. Twice only, at eco-excitor days, and when "psychical" per-sents were with me, starty clicks were board. Deep-sets were with me, starty clicks were board. Deepone located them at a certain spot on the glass be

max. Then the rape reased in the house almost as raddenly as they had began. They crosed too, it the offse both and qualemposensely. They convert for several fur-ther held periods; thes crossed absorber. They was cretally in the rows. With the exceptions stated they cretally appeared to avoid gatherings of persons. They wave cartically without say relating to the Another phenomena and assert 11, 100. It but ny secretary and another that site that the hands in secretary and another that site, them. The secret field was believed. Presently run controlled the light was believed. Presently run controlled the light was believed. Presently run controlled the second selected to that the light secretary of the second selected to that the light second controlled when and selected the light. See most controlled to the second selected that the light second controlled to the light second to the light second of the second second second to the light second of the second second second to the light second second to the light second to the controlled to the second seco The reather was warm and there was no steam in the

To crown all—thall I biset to confess it? I saw the table lift on one side and come down with a base

hands were felly on top of it and lightly flets a and fost were within my eight. These was no a accord; for the phenomenas. Yet the same p account for the possiziones, jet use some propositi arear produce such a display afterward to recently my attention was called to nymerical sources occurring in the office of an adocut pasted physician. In automatic writing it wast in my office that the "communicant" were set in my office that the "communicant" were or it were that pight to make these raps come on the fulfing a where they had not yet been heard. That night. the numerical of the writing being present (a payel contracted with the physician) the rape came upon

recein they came upon unother designated door, the re and dually back to the fielding doors. The next dig was almost without results. phasement of "supertermed" rape are, in my nt consider, but little understood on to bow and

files, thiough apparently interfered with by tur-at species on the part of the effice and by neigh et anywhere within bearing. Cannot appeare with swears in the devicing of in-pressions from an object held by a "sensitive" person, but with the character of the object convolled. I am constituted that seems persons do, in a large personage of cases, thus arrive as information regarding bisony. of the object or the one who has handled it to which is utterly broad chapes. What the u What the underlying

process in I have not the least idea. flore is use illustration from many in my unpublished records. Into the hunds of the "sensitive" w red a letter in such sanater that no word of it could he read. It had been taken from an old file. I know who wrote it but not what letter it was.

The psychic's eyes relied up and she went into an albered state of consciousness. She described the looks reet so far as ale avai-far the well of the letter. She pictured him so including to studentthen to a general audience. Each facts were true are was indicated a thrusting out the arm while white Charm to me as true; with two facers exded (not known to me but found hater to be an or necalierity) A Mg city, Boston, was envisaged letter was found to state that the writer had Just heer there. Another place agent out below a height: ap-Then a church, langer then broad, an old rch, a stage charch, with a steenic, with a cleck its the steeple, with statisticities windows, a recentery ng the charcle on the right, the stones in the

receptory all hardaugial—errory eleterated current garding the cityrets over which the writer of the latter The spenker secured to be standing in the cer and new lighter buildings bark of the clurch, old but not so old ne the church, a tree in fruit, two streets leading up from the apposite side of the charch; also, directly in front of the charch "what looks like un and but len't an arch." I afterwards found that if one stands where he sees the old (but not so old as the charely, lighter tenesses house back of the church, tree is front of the church and the two streets, he is directly opposite the prech and sees only its end tillars and succeeding reaf-honce what leaked like

let was not an arch. These were only two errors of hinor grade; "lighter buildings" for "helidings" over-safination of the height of were of the horizonical

The popular lived in another city than that of the cheese. The electroma was unknown to her. Not a word of help was given her, for I kept alkness except for a markin or two as I made the record The incident is injured by levelty of narretion but be the reader sak blaned, for exarrish here man residence he has ever men adjoining charden and containing not a single stone witch stone upright.

A hading nothernations. A. S. Hunkermoth, P.R.S.A.

a coloristed the probability of printing these much ly givener as not speep than one in five quadrillim-There is evidence, too, for the resitty of planture As the result of the analysis of a large matter of cases by Gutter, Polizonte and Myren, the bed-matted attentioned: "Designing private that phastrane fill pressions, values or figures) of promote underprice retails doub ore settedard by their



first to produce psychic photographs

frieds and triums with a frequency which prefame estant estich." My own investigations agree with this statement For example, a lindy too given to much experiences, land one affections in her New Jeesey hour a vision of her facer-leather and her father and sold her shore and nother about it at once. After the priors of the landles to the war, he told "the next moniteful expe of his 10th which was that when a tomorb, was an of MS IDS, which was had when a hepode was ap-promising his slip in the North Sea to saw his de-caused father beside him on the deck. The day of the two experiments was the muss. It was at least very close to the same hour. The signed rectification of the four persons are in our possession. Two many infin-

for cases of this kind cate, for them to be explain shie by ordinary muses. Azoder pletometen...tkni of telepolity or though temperature to not generally recognized by adentify

elve, so far as I know, to all scientific pays

researchers.

One of the most successful "sensitives" along this
line is no less a pressu than Professor Offsert Murray
of Onford University, a farmer previous of the Society for Parchinal Scenarch. Here is one example from a set of experiments provided over by the accountiated und experienced Mrs. Verrall. Professor Higgray left the room said as insucher

Professor Marriey Mit the Notes and an insequenty heddent was arranged by the foor process creasing, as follows: "Mr. S. playing Redminter of the Bod-nistics cells at Rogets. Leed Morray watching Leidon watching, one with a fast." Mrs. Topolive use the sateshing case with a fast." Mrs. Topolive use the sateshing case with a fast." Mrs. Topolive use the called in, and tille in what he sold: "Table has some-called in, and tille in what he sold: "Table has somebing to do with your veyage to Pansana (Mrs. Toyto bee had usade such a wouge)-it's Scott Assertra-its membe use in white claying a game-it's year villab here is a strong a passe—the weed Bagets in our fact to my mind—I think it is it a purse" club." Mrs Toythee acted, "What is the game?" "I think," the prodessor replied, "I are selly growther, But I think the game is Indulation, and the Master of Effecti the game is Indulation, and the Master of Effecti (Lard Marroy) is there."

Now take late consideration that the haldest was wholly imaginary, so that one known particular con not bring on either particulars in a known Incident, and will you wanter to say that this prealine extenting consistentian come about by chance? Every prearrough detail except the fax appeared in the result. Nythbu was odded except the white civiling, which proof society people physics a genre in South America The Society for Physicianal Howards reports a grezony cerest results by Professor Marray, segar quite complex as in this raw

Are there such things as preconsitions? There is a least impressive exidence for them. I mayo'f-shall I blash to say 213-bare had exactly four dreams in my emotion that they stand out it my artism as real overnoos. Time of these aver considental, while I de not reculied that I ever last may other dream which attracted an attention lesson of educidisc factor

which more at all taucondur-In one of three four drenss I saw a woman who had length to the abov her oun death warner, writt-In the color of blood. She remarked, "I can not afreid in the clear of these, No. Principles, "I the lock top hand it did but will you bold my hund? She took top hand and it feet its firm grown as the light went out and it Then I because conscious that her bead was removed from her bedy stid I but the wel blood upon her hair. Then her best opened and shut gottly several times upon my hand. I wake with the grac-come feeling that the bend was still litter after

I have. On the next day but one the particulars widels outsided appeared in the papers. A few loans before my dress a woman disastenced from her New York have in a described condition. About twesty-fo been after up dress, at sakhigh, sie hid ber seel spen the rational truck about its talke from my be the head may set of an electric as if he a heatelet



few table thyping is done. Dr. Prince once sur a table rise in an experiment



Dr. Hysiop (standing at the left) and the famous "trumpet medica," Mrs. Holes, who was the subject of many investigations.



cases was variously. Now were to see purce of easest than it took place in the dork her name was Hand the word which must frequently appeared in the lim agency of my dream there was found by her body a letter which said that her lead would be living affec-It was cut off off. These are the facts make of them what. This dream may re-solid, have been a sel-THE NEE routher use but what of another?
On Sattney S. 1992. (1) a train was standing in a causel in New York City. (2) with the rear and purching (1) another train dashed into it. (4) by a lead on collision (5) the wreckupe was plied up god nearly constant to the second was filled up that a number of deaths and injuries resulted (8) then neal case and cat easy at the wrecking to free the victims (8) then realising steam broke out in volume (7) more disseter to became beings received from this

time. Attention is called to the order in the details.
About four hours before the real accident 1 drouped all the particulars exactly as above related with fearful highest and stress of earth n. For full, them minutes after my wife awakened are I will sequed by bear the skricks of angulah and the bleeing of the I renember the whole today as If it really will recent Was this triepatin? It could be the Was it class

Will like beginner in reasonative. When a consequent of the service explaint to us the law which consequent up three proved cuits idential drivers to extend in the group of four out of a lifetime marked is specific. group of 1927 of a firstness market is specific qualities of virialment and enotionality? Of course I are much askened of having had such dreams but having had them would the no know what no d with then Shall I shall that there is senething in the 'Hand one on the built of trivyaths? Then are I to raise out that of the collision where the colaridences are just as pronounced above it copper have been of Sepathic origin.

Wedlamietic Messages. We are told that these are

contemplify trivial gardential is these and will not study the facts or discuss any case upon which will not stody the factors offerene any case upon which we place emphasis. The fact is far ofference. My feater daughter. Do its vary framely one of the need extraordinary course by facultic accounting -a phenomena which all | without plate to gather one studied. The munichs after she had attained broughty Dr. Djeskey brought her from Calif rain as a subject of experimental with his pricile. His Cheminals of Descon. Well known is the case is now to like had then undersed in 19th about her. Yet had procehad the appeared B (FR) sheet her. The had never Bred within 500 miles of West How wells and there was no possible opportunity of behave. If face, about her. Dr. Illysiap Himself into a shoot in thing of her early 16. The medians was haven to it which or is mile a woman or a child was to be the next offer and may inverse part into a transce before the setter was beinged a. Derin selected out of a longland a lill an und became described on a common a Hillier and became and make and denn held in the inclusion and was not allowed to speck. Fiven need actional by the Rydog is a part of the recent of the subsential writing league and the very first which was notified one like N° the name and infinish of her fellin, Infiner. Any thing recognishes about that I has if it were shoply than preservable about that I has if it were shoply John but John E is a very different motion tweet are bettern in the sinkshet and arrange of

them may be crapied with any one of many batters. Presently the author really decreased, professed to emergations, and in a helf doors strings posted out facts correctly related to the daughter and to haveld,

Frame III was the marks from James II was a second point of the se th ugh set all were cornect to not subtract from but tables add greatly to the freemantion odds which the dectrine of game would have to face in this case as my little book now to preparation will show

My peptho-stalytical friends have said that if they could unalyse Mrs. Cleanwests—me subplated "for six papths—it would be probably found that all these attentions were leard upon experiences of the medium herself. And I do not doubt that they could find that the once knew security faund financement, people critical analysis, or cramble under the blows of the The various par

could contrive to find con would all this help as an o anusing correspondences with the past of the

taid in that the case I have just also taid in that the case I have just also carry its close on its face, and he he much for them I who have studied forty times an moch as he, and here us of freads and delusions by my own as has depended for his motivines mostly of others, tell him that I have taken its

of others, with him that I here than then to so me as thereging in our yolder, and the list it carry in disses at its back office and the list it carry in disses at its back office and the list it carry in disses at its back of the list in the li

against great odds as to chance facts unknown.
Bring person were revealed.
The scope for illusion that prevalent source o
where physical phenomena are in question, is as where physical phenousna are in question, is small in phenomens of a mental type and can be completely elizabated by a correct methodology. In gains of al-frecid and delaison all havis Inference and possibilities of chance and in spite of all the vagaries of derected and conduction of would be but liberapiped pure gainers, there remain like healthers in the field of pepulsical research facts which will not yield to the scratter of the detective diseases in the acid of the



duction of an actual about of a referring to the rape which he



meral view of Leptia Magna looking toward the Thermon, or Bennas Batin. In the foreground are three of the two hundred-odd areb cornicts now compared on the work of execution









An Editorial and Two Announcements

Lessons From a Tragedy THE Daylog air meet of 1904, the similar piloted by Captain Burt E. Storel of the Army, apparently distanguated in the air test as the Captain was bedraing the race for the Pulitzer seed trooks. The fragments of the simpleme and the body of the pilot were driven deep into the well of the aviation Seld, which is located upon ground that was store a calciumed. D to 400mile to be sure less who this problem or

curred. Reports of ope witnesses agree that the airrists came partially to pierws. One wing or a part of a wing was detected while the signings was still in the sir. The question is why this imported In the beginning of a race for high speed it is the custom to climb high late the sir, make a sharp dive and then fatton out just before crossing the starting

ige. Thus the speed accurainted on the dive gets the sale of with a special start on the race thair. This plan was being followed by Captain Street. It is conceivable, therefore, that the strain pet on the when of his pinning by the writer formation at the end of his fire may have been two much for the wing structure. But this is utilitriy. Some witnesses report that the skip seemed to come spart before its our and been fattened ser. Furtherness, the fact that the framments his the ground with such trementions force arrays for a much higher rosed than weekl be attained by then five full after the skin had distanced Brerything indicates that the obly came sport, for season as wide it was still in its desaward dire toward

the starting line The most probable cause for such an accident in a failure of the countier. On a stern dire the property come a winfault readed by the most of the airtists. It may attain a speed succh greater than that for while it was duringed. It drives the staging instead of being

Some of the fragments of the propeller picked up offer the Darton creek are proceed to show with breaks. Such evidence must not be over-employees but it reinforces the execusion drawn from other ort duce, to the effect that the propeller pailed apart he three of the centrifugal force due to the high diving speed. This unbeleased the engine. The consequent

Gratton Receils shock the airplane sourt. Two coestions arise. Why was a wooden propolite used butsed of a notal cort. In it worth while to sitain high-good records by the desponess expedies

of high diving at the start? Doubtless there is a satis further exempt to the first resulter. It to hard to see any against to the second careties exceen a negative and Records or Utility?

IR Daxton trupper reinforces a conclusion which is increasing torry and racer apparent to these who follow the progress of sxintice. It is this. The writing for greater and greater speed records has gone for enough At the britains of the war the maximum road of electrons now about 700 colleges to hour the 2010 this had climbed to about 150 miles on hour. Then come the offering of the Poilton treely and the remain beget to climb again. Last your at St. Look, Lincorner . Al Williams few at a speed of more than four police a pipute over the 125-selle copre. These records are -eren, one fears, the sufety of the pike-in succitival

te that single and There is no death that speed records out be still further increased. When if the rules is altered to pro-Mich the superintively dangerous initial dives like that which killed Captain Sheel, truth greater meeds than amount second will be not sofe but needble. Our rate transcenses of design that are already related

will help this. The biplane wing will give way, in ap tern, to the closure managinas. The retractable closeds to already in one on more designs of high-speed skips. The wing may be designed so that its cross-section can be changed in the air, appearing a very thin prefix after the ship has attained a relatively high speed. Reserve of 200 miles an large or even more ern catte within our resc

Fet are those worth wide? May it not be a bet policy, even from the military polar of view, to delay facilier need development of the fast races and to ollow the slower fighting ablps—already at 180 solles from for single-seat pursuit airpinnes—to overtain

the development of the recent It is a record charge that American eviation, with obtained successful in securing speed records and in developing fighting qualities, has larged sectorally belited Europe in the perfection of commercial credit. This change is not really justified. At the Dayton meet core than 200 alrylanes flex in from other airports complete riskings to the most. There were only two or there forced landings. A Stoot sirplane few from Detects with a pilot, mechanic and six passengers. This does not look as though America were an atterfor

lacking in organizated alternate as more written would have us think, Nevertheless, the development of the regar metal exalities of constort, safety and dependability has specy-elegably larged beints the decrinoryst of your let us have some constanting record like the Pullmen triply to letter said to revenue the accomplishments

de descri

B T COSSIDERATIONS like those settined it the preceding paragraphs the Scarston-Awarence has been induced to innegative a new department. It will be a department of the use of attenut. In this department, the first invaluest of which will appear in our Japonry lane. no will present the news, the promperty, the hones of

The department will be residented by Probesor Alexpder Klesin, American Professor of Accompation in New York Datements

The Eclipse Investigat Many excelerate have come in for the extensionalism of the total solar entires of J. say is, 1921, he amounted to page 218 of Scientific American for Forender, A few of

SCHITTE ANDICES for November. A few wars tre media.

If you are willing to listen to appeal rignals which will be broadcust for about their passable fairing the college and to report what you have, you may sealing as to determine the mysterieus effects of the run on radio transmission.

This is not continued for the rest to send us ALL of the following information:

Your name and mail address. What is the make and design of your re I. It that is one man-reaction?

I. Black blad and size of extenses do you use?

I. Do you are sharpe bettering or day celle?

I. Do you are sharpe bettering or day celle?

I. Do you are sharpe bettering or day celle?

I. Do you have been an one-time flowers will you be reciting to and myssile if we such you to, bemining to and myssile if we such you to, bemining to the flowers.

The Eclipse Editor, BOINSTON AMBROAN, 555 Broadway, New York, N. Y. Full instructions will be sent you later and will be printed in the SEGENTET ANTICKEN for Jou-na, 1985. On page 170 of the present issue there is now account of the public observations asked by the American Astronomical Society. Thus, to, in will despite or detail in our sent issue.

Another Assourcement N THE opposite page is an an may prove to be one of the most n

tionary discoveries of all time. The eccous-revolution — often presched, more off feared_will never come about through soap but one tory. It may result either from a flood of cheap gold of from the discovery of some way to tap atorale p Stock of these possibilities are bound up with it tions of named transportation. The three pare Professor Mische and which we are now rep-the United States.

The field of attente science has been o in the past ben years by exce of the most remark and far-reaching discoveries that science has ever the The Scotteres Anderso brends to keep the med abreed of the progress of research in this reals of the tiar but marveless sixts and electron. Atoms are so small, you remember, that I

of them can lie side by side on a plapeint. Electri

Criticizing Professor Einstein T MAY meen a fac cry from the they dis fitnersions contemplated by the Erect Theory of Briadistry, with its beating of light roys by a fact or two in a billion miles and its unitaries that current back of some was distance too

But estually the Staniels Theory and attents playing are never for apart. The nothernatical furnishable of the Relativity Theory has been of the greatest aid In the rigidistion of about stramure. Conversely, the best evidence that exists for the countiel correof the Electric theories lies it seems to us in the field of attends physics and not in the field of astropouts. It is perhaps fortgaste for the ideas of Profit Mastein that this strong evidence exists. During the past year there have been two vigorous attacks on the Electric point of view; one by Professor T. J. J. See of Mary Island, California, the other by Profess Charles L. Paor of Calumbia Dairector. Both he here based malely on doubts of the astronou

Arming the figures three proofs of the Et theory there were two that were astronomical; the peoof from the deviation of light rays that year close to the sex and the proof derived from the slight in-recolarity in the motion of the planet Mercary, an irregularity left anestelated by the ordinary, tenian theory of planetary motions. Professor Po attacks both of those proofs. Professor Bee co binawif, in the main, to the first of these

Profesor Ser's attack can be districted in a w The believes that Electric's reatherestical extratare wrone. In fact it is fee that is wrone. mathematicists in the world have repeated I'm extensions. They are unprestionable.

The applicant of Professor Foor is a much strong one. He potents out that the ferintion of the light re-

cost the run is a very difficult matter to recent past the may be a very difficult matter to reseave with accuracy and that the data obtained are reasoptible to other interpretations. This is understandly true. As in the irregularity of Memoury, Professor Poor empants that it is expansive well evaluated by the assumption of some distributed matter in space, an assumption for which there is much other orthogen.

wants seeme in turns other oversteen. But the great strength of the Theory of Bolativity does not like in three two supposed astronomies "process." In the in its surveyer in attent physics. For example, Dr. Romerfold, of Vienna, used the Eigenia equations of motion to work out the critica of the electron particles in an about of hydrogen. Fre this he predicted what would occur in the light at trum gives out by glowing hydrogen. It did not This is only one instrume cut of press

Why We Are Trying To Make Gold

scientific minds of the world—for the unrient alchemiate were, in their day, the very figure of editor street without constitut to make id out of some bear metal. They failed The supest of some case ment. They take "the road in will some englant books and solich was helpend to beau the power of turning overything into gleaning gold this tragic talisman persistently cluded all search Straily the sensible men of the world grew gradually to believe that all this effort was nesten. Address fell tato divregate

managaragaspara para para da cara da c

And now, after unother two resturies, the secret of saking gold seems to have been discovered by perident. Where the later and intelligence of an entry thousands of alcherists came only to fallers, a German college err secus to have approveded by absolute lack. His magic wand is not any somile stone of the philoseers; it is the more modern magic of electricity. This, at least, is what rout of the selection of the world are now inclined to believe us a result of the

recurrichle observations recently published by Professor Adulf Niethe of the Charlesmann Technical College, page Rents, and marrianed briefly in the Srms-Professor Miethe was not practizing for the phi pher's some; for from it. He was engaged to re-searcies on ultra-rices light. To process this light to tent talendly he employed a quarts herp containing the vapor of moreoury, the liquid metal function

to everyone under its other name of quicknilver. or of mercury was custained in a bulb made of fused conts. Through this vapor there was passed a powerful current of electricity. After a time Proor Methe poticed that the inside of the quarte belli had become coased with a black files. He analysed this It proved to contain gold

This was astonishing but it might be accidental. The professor started afrest. He get some new mercury and conflitte purified it. He divided it into two per-One portion he placed to his quarte lump and then not the lance for two bundred bours. On analysis issue: no mild was found in the other tertion of the me mercery, the puttlet that had not been expected to the electric current. The lamp itself was then taken to tert and analysed. No gold was found in any part of it. The conclusion was involuble that a very little gold had been created according during the cognitive of

A few of the secretary atoms into alreas of gold. That is where the matter stands as these part Advittedly the experiment needs continuation. But Professor Metile is a scientist of distinction. His processions were to be adequate. There is not the slightest exestion of his becauty. the enginery there is many rouses to believe that he has netgally done what he thinks that he has done is probable that the secret of the philosophor's stops

If this is true it is one of the most important with tific discoveries over made and not all of its important is erlentide. Gold is not only beautiful and source and valuable; It is also the house of modern finance.

of paper the actual value of which is betidan pts It become he known that he can take It to the beak and get memory for it. Even the memory that he gets at the bank is likely to be paper mesory. If so, It is, in reality, as valueless as the check. The acres ty of a bathkeete in ordinary business reals upon the imprefedge that such a note can be taken to the Diffed States Treasury and exchanged, under proper zens and conditions, for the only real memory in the

The entire rest structure of modern by you a possi and a fact of psychology. The me d. The fact is that men all over the world believe

make it choose, so that gold become at outsuft of We easily helist our loss of gold, which would be both beautiful and newful. Do gold down and meet. Does it in processivy unlikely that many of an enough how forms to build become with or model be silve to live in them if we had A solden destruction of the belief that gold is valoable would work the falser of business in a day, Starrotting, war, postilence would not be far beinted The undern world is a budgets street. Wreck has ness and the world goes with it. Chang gold, mobilely

than all the number and thieresties and ware of bleton Why, then, has business survived without own a rippie the attaurancement of Professor Miette's disconery? Merely because his process to not cloup. It nots Mr. thenwork of Own or york to make his mild from

What We Hope To Do Protessor Adolf Micthe, of Berlin, reports

that he has contreted machaliture into cold The Scientistic American is now arrenging for the repetition of this experiment If the transformation of quickeliber into

cold is conferred, we will endemor to docover exactly what conditions control the It'e will obtain data for an estimate of

It's will make the best pracible estimate of the time-of ever-when the world will have to face the threat of cheep gold He will communicate the results of this imperioation to the public unless, as a matter of public policy, it arrows unse to delay their

the cost

Autication quicksiber on it would be go and buy more gold in the

But this expensiveness of the method near not be official. Most things out a great deal sizes they are for discovered. The cristical electric lasse con. It in practice, more than a thousand deliers. Non-you can buy a better one for thirty conta-The Incorporate fact, therefore, along the publicability races of Pentinger Whether in the nominator that it tray by cheapened. Fortigately this is not libely to m seatherly and it is only a state of the st

gold that constitutes a threat to business meany. We one skift the bests of world credits to sething else; for exercise to the "exercisity deller" signified many years up by Producer String Philos. a meteory unit the raise of stick is described by When you pay a bill with a check you two a pice the energy matter value of a number of laway eva-

dities like wheat and coal end say The great need of the present situation, therefore, to stern facts. Thus the Mirths several really make redd? Exectly what does it cost? What are the promotes of chespening it? Can we expect over to make gold more chesply than we can mine the natural gold from the How seen, if ever, one we expect such chasp gold to be analighted

Gives these facts the privatorests and these be world run propers for whatever is probable. They can take steps to control the gold-making process if that is remaine. On they can recover the executives of fixures for an ours transition to whetever other standed of value mean agreeaty or goe; desirable

rain Assuran to organize a rareful repetition of the Mistle reperiment in an American Internsters. As refigurates have been made for the concention of Professor II II Shelfen and Dr. Kirolas Banhersky of the Washington Senate College of New York Uniregions of the Separation Authorse. The Schotter Awren-av is supplying funds and is leading all of its own facilities to the work. The object of this work is not mercly to make poid. It is to discover what if will coal to make gold More artificial gold would have tremendous er

or deper insicht into the meny uperired problems of denic structure. But these things, interesting an they ure, are not the impelling motive of the Somewhele Aucures. What does impel us is the daty of fereoving, so fix as may be possible, what is likely to hospen to gold one medium of exchange and a steadard of Snapetal values. That is what we bego to fitee what we hear to be able to make public in future bears of to communicate—if it even that energy is

ers-to the huders and directors of the w A surplem debards of values based on over world be a world misterings books which ware and surfaces and the Black Doubl are more said annoyances. one filing that will starely present such a debuck in advance knowledge of its jumineurs. That advance knowledge the Supermore August at helicage it his date to provide if it by trangity possible to do so

What scientists have burned in recent years also the structure of the stem recordes a screen theoretics hade for Professor Matheback date of the consension of nevery into gold. It is now believed, you remember, that the atoms of all chessical elements are composof two binds of electric morticine married burdless railed electrons and meltily particles called prote-All of the protess and some of the electrons in any give also are believed to be concentrated in what is added the nurleus, at the stende center. This neckers miler ersten, it helds the store together. Around the

ngries novice the resultable of the electron, but as our carth and the other planets recoive as In the story of rold there are 20 of those planets terious and in the steps of mercury there are 40 o these. That is, if you rould knock one ricetrus pla remark-nilt and of the mercury along two would have in units of gold It is easy to knock out this can electron temporar

les that downer de sty good. The electron cases back again 21 to believed that to knock out the elected permanently my most effer the market of the mercury stem, we want give it a lowered electric attraction go that it will not held more then the 29 planetary electrees which elementaries the stan of gold There are 180 were theresterly in which this tight be detr. One pay in to preasure from the markets one of the problem particles or problem. decrease the sector-attracting power of the nurban he one unit and make it this to held only To planetery

electronic limited of St. The other may is to add to the markets are electron, than rentralising internally ers of the available electron-bolding units of the ancions. This would affect the number of external electrune are letters, decreasing it from 80 to 70. Braders of the Schisters: Autorian wift be bruring more about these atomic changes on one experiments record and as we are able to possible the results the counties it is interesting to exacter whether the

tent sidesside, so thoroughly discredited for so beg a time, may not have made gold other oil. of them chilmed to have done as. A manter choused to have done so from mercury. Possible then really

Our Radio Page

Listening-In on the Latest Progress of the Broadcasting Art

a columnia care cost e utaližni bethelitaližni



ispeakers of Today and To-ONE of the attenders of pepular radio is that a develotar pair of our photos will produce better music than a fifty-dollar leadepooler. Indeed, dred sele than a fifty-dollar lead-poster. Indeed, dred

for the most part significantly about by our phones and ed to orgelder the broders The weeks conception of a localization is that of any sound-producing device equipped with a local solid used in conjunction with a radio receiving set. Thus, we flad all kinds of bons used with raths receiving sets and seffnery belowing previous. One or but as to project the nouse into the room and in project the face-only of classifing the receives to the erivers are clarated to the usual photograph time and, so that the photograph here may be used for projecting the radio made or speech

g the rates kinds or specia. Devices of this kind are not to be considered in th same class as bushpeakers. They are notely tupos visious or make-shifts. The mend belegious receive to designed to produce sufficient scenal for one or an ear plaste. The vibrations of its discharges are less sufficient to vibrate that appeared of air which is transed dween it and the ear desta when the receiver is a In the connectional manner. In order that the same receiver may work with a horn, it is necessary to increase the untillinds of the ablections—the streke of the displacements to open—and in this manner a greater volume of sir is set tributing to that sounds may reach the debate our of the bottom. Thus, we overload the review, with the possit that his dis-disphrists etrice the prin piece of the extension or bething inside the case, and your disturbing is bound

The Three Classes of Loudspeakers Oil real hundredor results want volume care

FOR real harispeaker results—sound weamer com-parable with the conveniend plottingraph—it is trecessary in the case of the three closes of real lade speakers. For the purpose of reals identification, standard isotopouleus may be divided into three local selfestions, namely. First, head-postern of the th electromagnetic type, which are merely and feel. shandard felenkete periture, and which corner on the tpet of the standard investage such amplifier; magnetic part of the amendors of electromagnets is not applied directly to the displaying a lest instead is unpiled to a member known to the amount which, it suggetic pall to the disphrage through of levers and links, thus supplying revisation untiltion; thirdly, the electro-dynamic type, with the di through which flows the matible current, and which is outpected with the disphragm The plain electro-compatible type is by for the most common today. It is practically all outgrowth of the table-talker, with a more powerful triophone unit one tame-tauers, with a more poweress triopi-us unit and usually some assum of varying the air can be twent the pole pieces and the dispirages. The sletter

to very the air gap is highly desirable, since, with powerful elegate the air gap rout he increased so that the displayant, new greatly flexed, will get sirils the pole places and cause a high or clutter, while will work algorie, the air yes must be reduced to a mininam so as to conserve the weak augmetic varieties. In the electro-mechanical type of loadspeaker my fini In the electronecharical type of isotopeaker was find a new latitude from of uncertainties for friendle-ring the electronecharical pail to the displacem. The validation are appeared to the displacement of the validation terms. The displacement was pix of exist-tial-local particular or any material other than from electric displacement and the permangentic, as in the case of the displacement of the permangentic, as in the case of the displacement of the permangentic, as in the case of the displacement of the permangentic, as in which the disjumpers never not or preceding one of the case of the electro-capability type. In this registric is houses possible to obtain better acquarts properties. The electro-cardenical type takes care of powerful and creak signals allow, since there is no delicate six gay to adjust between the join places and the displanging although some makes here an adjustment for regular ing the electron between the sensetime and the electron poles.

which makes use of a reswerful electro-sugget with which makes use of a powerful electroscapes with a small all tags, as well as a very small cold for sife estands to the displaying and five to make it that a tags. The little cold is considered to the displaying and five to make it that the same in the same in the current of the raths set as amptitude passes though this little cell, it sets up a magnetic and saids notice on the powerful analysis for severating the small cold saids seek to be a set of saids to be seen off, analysis the labor to the strongly freed out or drawn into the powerful magnetic field. The cell is freed in or on the areas securities with the floating of the cell and the cell and the cell and the cell as a cross securities with the floating the cell as the cell as freed in or on it a cross securities with the floating that the cell as freed in or on it a cross securities with the floating that the cell as freed in or on it as even securities with the floating that the cell as the cell as freed in or one in a cross securities with the floating that the cell is freed in the cell as the ce there of the current which passes through it; and, since it is rightly utnached to the displayon, the larter has to follow its parties and in so dated it produces sound True the displacing translates the value or most correct coming from the radio set into multipe signals. the control of the reason of the reason of the first period of the The electro-dynamic lendquaker has several points in its favor. First of ult, it is capable of great sound

volume for a given input of energy. It will not blust or hand on the nextle of examps corresp, since there are to mediar nerts that can come in contact with an sary netabors, as in the electromagnetic type. will take once of weak signals as well as powerful ones, without adjustment. Still be resoluted the strength of the augmente field, it is possible to excited the sound

The Loudspeaker as a Musical Instru-THE newly of radio mosphiss haring worn of, since halls breakend in new at every day occurrence, the A holio breakest is now as everyday occurrence, the radio antifactor has developed quite a critical sea: Baddu-enghaves loave not been slow to realise the greating labeleter to radi mark from radio recepting who, and the avantation and of radio reception has received due free net irelied in referring her received due free net irelied in the handling of soundings. This work is reflected in many of the while from not initial in the hadding of suspire problems. This work is reformed in many of the provided by hadquesters. Addit from the parier act-front independent and nontrantum, must inabspaces same have been expectably designed for the electrical much-ation, the person must be properly balance, there must be no lower estimations which infalls cause estimates around, the authorizat and must have the dealer action, the person and the properly the same of the same, the natheritat and must have the dealer and the same action of the same and the same of the same and the same action of the same and the same and the same and the same action of the same action of the same and the same action of the same actio tricing the satisfact and so on.

While even the best includes the next here

While even the best honderealers used hereights force not any cappeached the resident of the head force not any cappeached the resident of the head force, that goal is before approached by loops and beautiful resident dates not approached by loops and lateral than the second of the second of the lateral than the second of the second reproduc-tion in the second of the second of the second countriely the few more, wealth be too loops for orthogo-tion. The present treat formed once resident loops 100. It is flower to treat treater there is speakers series to be it in the direction of humiless isode-speakers on the ser-hand, and multi-looplysaker units of different ranges of picks, on the other. The tensors prio away from the reconstit effort of the usual horizontal away from the reconstit effort of the usual horizontal which the learner, other they are included to the grant while the learner, otherwise the includence of any given

harm, makes the of two or more had certain range of pitch, the group of I ranged so as to operate at one time. For the voice or small convents will make that horn and displanages best settled in temperature. Afreely, one radio se appearance with a battleds rayships have

THE bar example of the horrison looks of developed in the laboratories of the Aughste & Telegraph Company and the Wallen Company. The design of this leading-safe the low notes of the 'cells, organ and pt

Context. The design of this behaviour is such that the learn agreement of the learn agreement on additional time agreement of the learn agreement on additional time agreement of the design and other agreement of the design and other agreement of the learn agreement of the le set and illering cames the coins to vitests and reply done the sound that is being sent out from the radio leoudousting stells. The coins are apprecisately signises inches in discreter, and the discusse between the open of the front cone and the grating at the best is about five locks. The whole assembly stands up s about five litches. The whole assembly alonds muximately twenty-use inches high and weighs m sounds. No saidth-mail batteries are received in one ile loud-spenking device, since it operates on the wo-man audio-frequency anglifer. Two-stage audio-frequency simplifier.

It is interesting to note how title cone type lost sneaker run be municipal. The author has seen made arranged in whether nonmitting totershed for holding them on the ceiling of a rees, gathe incompletous an out of the way. It is understood that this type bell able to multiple in the form of a learn shade.

Whether a hond-speaker is of the form or the born one type, the truth of the master is that the born is hereating observe. Just as the photograph here disap-tenant little more and made ultractive cubings, by petter with the "works" of the phonograph, so must the radio intrispender both disappear, either in all the radio products of its over, or into the cubiset of the radio products set, or even late a celling factor



Radio Vacuum Tubes that You Can Take Apart



No of the most satisfying rithings obsert rolling to the fact that vesses tribes will not lead to the contract the mill are for every and cannot be multi-projected. On the contract the contract tribes are contract to the contract tribes are for the tribes of the contract tribes are for the tribe in the less likely to go out over if the witten are for the tribe less that is undefined in the contract tribes are for the c has any their construction in which that it precludes that there prices that we have come to enther the such covery proces that the native cours on which the deficient orticles at the capping-filterant electric larges. And the most frugite just of this expensive and deli-cate natures take that we six usest use its our radio-sets fat the filteract. A timy bit of timpates when cost-ing only a fraction of a cost, so small that you can routy as it taxing the vacuum tales, repairable in a most if you could get it out; this is the fifther that was or berns out and destroys at least nine out of

when we found that the story of the state of

takes and especially his construction of a glassical taked take the parts of which are easily decorpatable. rished take the parts of which are easily demonstrated, may be regarded. I believe, us the first step paramit the decling of a granifer take so constructed that a fazonet fault can be regarded, when becreatly. The most redical departure of the Bolwork prover takes from the designs that war usual for high-power vacuous takes in the fact that the take in attached vaction takes is the fact that the time is intense pergaposity to its own vaccom pump. The vaccom in the take is not created one for all and then left alone, as it is in celliusty takes. It is existinally alone,

circle, as it is in enclasing mises. It is entitionally necessary that percent closes the said of the said gauge with which Problems Biothers is merital and gauge with which Problems Biothers is merital to the plantegraph reported out this percent to to take invoice is the number issued collabor the top which in the properties of the problems who has in the homestal flowards that curries the spirit said the final which will be the problems of the problems and the said of which it is assumed to be problems and the problems pump is the recent hereal the during her desired to be the problems of the latter of the problems and the problems and to which the latter of the form and the latter and the latter of the

beginning to which the horse out of the role is a few decision. The part is, his shock to industrie and it power from the part is, his shock to industrie and it power from the part is to be a few decision of the part is an experiment point in part is an industrie. Down the part is an industrie to the part in the part is an industrie to the part is an industrie to the part in the part is an industrie to the part is an industrie to the part is not in the part in the part in the part is an industrie to the part is not in the part in the part is an industrie to the part in the part is an industrie to the part in the part in the part is an industrie to the part in the part is an industrie to the part in the part is an industrie to the part in the part in the part is an industrie to the part in the part in the part is an industrie to the part in the part in the part is an industrie to the part in the part is an industries. In the part is an industries to the part in the part in the part is an industries to the part in the part in the part in the part is an industries. In the part is an industries to the part in the part in

it a variate and enthor, he used. The variates purposed in The variation pump works on the entary principle, strendy much used in physical inhemistries to state a high degree of variation. Indice the best-arraic harries shown in the photograph there is a most cylinder, accounted on hearings so that it can be removed market. by useum of the mote the elevely temptain of white on seen at the right-hand end of the pump is the photograph. When this cylinder is revolved it drags photograph. When this epithder is received it di along with it a Size of the air next to its surface. Detweet the outer surface of the receiving cylinder in the pump and the cylindrical metal shell that are in the gamp and the cythenteen mean steel that key regards it and finelic which it revolves, there is only a west narrow state. The resolution of the inner cythe for drags along the air inside this narrow space, so that the air is palled over from one side of the pumo On the side toward which the oir le to the other. On the soar toward waters are no or palled there is an escape love for the six. On the other

is a varyin and remove he used

-the side from which the sir is pulled—the hale that connects the pump with the take that is to he extension.
This revision gamp is kept results; wherever the tears take in it use. It not only premise as twice conservation that can should after heart and their not be bett. Cheeding, as such a way that it is descently be bett. Cheeding, as such a way that it is descently be bett. Cheeding, as such a way that it is descently be better to be better the constant in the time.

A great advantage of the Bolowed robe is that its houteness are stimulated as the profession of the most act to examined. It may extend to be aboved which the trible is reasing. The perfection of the uncertainty in the time deposition at the equal of

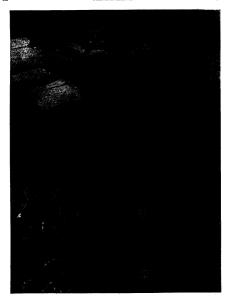
the pump that is keeping the tabe enhanced. If for any reason the operator desires that his tube he a little arry course to the base to do in to slow up the purp. This lowers the degree of vacuum in the take by allowing a little more gas to remain in its. Coursewly, if a higher vacuum is a squitted, recreasing the its course of a lamber ie, the operator merely increases the speed of the

party.
These built on this special have been constructed to deliver as much as 30 bilevants of power and to real with plate voltages as high as 5000 with. The largest takes so far built on this model has a critistrical state

out two and one-half inches in disascter and about This want principle has proved useful, nice, in one structing variant takes for X-ray work. The noder form of X-ray take used by surgeons and dentities in pends, just us from the radio varieties fulse, on a street, of garantees of particles of electricity, the electrons, see from a but turned flament contribut in a vectors. Just or in the case of the radio tubes, it makes a difference solution on X-ray tube to hard or soft. The hard other whether an X-ray title to hard or soft. The bard other give the short-wave X-rays of great practicaling power; the the soft tubes give wares of lenger searcheagth which practicals the height piones usual heat despit. The give-consisted various title also krownted by Professor Bolsevick and their state of the large in sea attached to a continuously-operated various power. It is exhausted Hier etjoy takes, once for all. is enhanced like color tables, once for all. In intersor-metal parts are so constructed, however, that it can of any failure of the tube they do not have to be through away. The glass both of the role out be cut. threen's way. The glass boll of the robe can be est, the metal parts econored and regalated and the tube pumped out again so that if it as good as new, is a mental address before the deviations of polision, in Parts, Professor Identity as and the control of regalat on a 100-kilowort; power tube was only about the delican, as against a rost of between dity and shifty dollars for tubes constructed in the name marner The extension of these important ideas of Professo believed to the smaller varieties of vacuum takes use increase is the summer varieties of vaccing times used by the breadont listener will come, it is probable, in the direction of this sine-contributed table that is evacnulnished at the proper recurs by the attachment of each one of them to be een revolting vacuum pump. The latter than would be too combernion as well as



ned vacuum take the glass built te can be cut, the metal parts removed and and the tabe can be pumped out again so



A Cently Dump Heap
The axis judyped pleased above and headed in Chicago is only a same more of the requiry heap and early motor damp. Figures and a public by
the Concerns Commission above that out of the 4456000 colors and public damped only the first Central Steam, core to the value of the appelling was not

The Latest Developments in Bank Burglary New Scientific Devices Used by Burglars and How the Bankers Meet Them By Edward H. Smith

bank was a root significant and monoring i. It was, so far as I have been able to the imprist of the first excessful atte

refs.

This order was not without its administration. As for as 1000 are 1000 time supposed in Names and the control of the co

ments and the basis of the rich work of the court is an order developed. The was at the record design and the court of the

ment was either antiquated or not of the less,



fra. The use of the teeth by bangines did, in their, breaksy skredy. It was all of the years before they recreeded against what quald be teened a gazumely miden ads. Looking back on the elization, it seems attenue that there there did not enter into the extended in the backers. The midde have necessaryed the bedonlar-of bargiary with altrophysedise in the United Stoins. In which case they must have seen that here, but, the development was sizes and the spiral of the explosive time sizes and the second of the explosive to the hands of criticisals a gradual one. It might have been freezent that the possibilities of the treek had not been exhausted and that knowledge of its powers

and its imported application would find its may to the crissinal world torolly. But all this is no mark soil sales, 1920, a super of topology palar an

enquestylene teerk managed to breach a needern man-parese steel safe in the Fernanc' State Bank at Ship-shevana, Indiana. The benking festerality and a good many conservation and makers wole up in the next few days and began rubting their eyes with sadis fingers. It was true, then. The presences on white. The best kind of sufe was no more familithan its older relatives as the insentiale between medius other heavy to paneo rafes were borned open in Indiana, Californ through and then in away other States. The of

and sufe associations of the country. where about bank burglars in these mars, two years age, I rolled attention to the beeck and to its later complement, the flucing rid, and dealt upon the extent to which these instruments had externed into the culmarriage of the builders of buck venits, such as these however, there have been distinct and highly important singularities, both effective and primitive. Defice we

can understand the significance of these developments benefit, of get the follows of their compile force ating.
Since some time before the Civil War the Asserting safetuaker has led two problems to deal with-the med explainers. In the legisling these two destra Surroy were in the cause hands, since the method was to drill a hole into a safe by second of which it is be sained with black powder. Later, when attre-ghereties pupe into too, the drill became obvolvered

but his interior could still not be disregarded by the Ills predect had to be preef against all the leaves, inspirements of artiscs. e kanna i ingermente of ortoga. To sindany each sufer has incre such suid ti done for the two energy forces provided for their dedate, a setal powering the africanties and lines grante qualifies of dariffity shi harders. It was east charge to make a notal hard strugt to turn the drill her and metric were bettle and flew into abords before regionless. It was likewise, not supposible to produce emplements. It was transported to proceed a legal resistant to other a legal resistant to solver a legal resistant to solver a legal resistant to solver and state of the discount of the contract of the cont

of through their still out more truster One of the first types of hurghar-proof safes one of several sheets of iron with sheet springs, to be tree the drills, placed between the sheetings. numbers did not realler that it was an over metter drill through the outer short, fill the interprise w







DECEMBER: 1924

powder and so hime of the first defense, giving immediate arress to the several Next, came the much talked of freeply start, and Owner called change steel from the fact that the hand layers contained a world percentage of chromium Process steel is a name which describes the analyst gers of soft metal to give ductility and the two levers of hard matel to often hardness, incultared to edicactives score

Nitrogiyeestar was readily used to him these Then came Franklynite or spiegoleless, which was steply cast from containing about 20 percent of non-parers. This subscience was used for making solid cast safes. It was drill peof but bettle and us its

seconds was likelied. Back in the days of the powder hurgier th the other theory of defense used by the suf-maker. homely the plan of an other shall or safe with an interstrongives or languages of class. All these sufes and chests were of instituted requirection except a few cast-free specimens, and note taxed happy and profitcan-tree speciments, and note their happy, and table arrangements for the nitrogly-veine larging As a result of strengthermer and its strength, a reason, the investor of the streng engine which bears has name made a series of experiments, and emphasis such type of safe of wild childed cast loss with wallfree St to theve states there. He also knowned the free lightfolight door, a globaler effect, which may still be seen in the best and there.

Mitrodyceithe also freeed other sade makers to reins their soils to the are wited. Indeed, if changed the whole structure of soles, and the round or seres, door come into being, its design having hern dictated by the fact that the "wesp" benefits from it over to be his him seep thin the starte of the old square-duer agine. which could not be made to fit rightly church to

the burglars. Then, bowerer, come a rostallandral triaugh treed the sevent of safe-naives calle cour from structure and back to materials. He linked likelihold of Sheffeld brought farmed his autgazese stort, a which also contained management of proposition, which also contained management. Haddedly to-day was a steel alloyed with from 11 to 13 per-vert of management. a steel alkeyed with from 11 to 15 pervett of man-passes, the traces being heated to a temperature of from 1775 to 1850 degrees Fahrenheit and then plunged. This new management steel embedded in Itself the hear sought (Seal combination of durillity such hardness if cast in sufficient volume, it could not be breached

with any unitie amounts of explaning and it was drill proof to the limit of testing.

In America, there can brought this new metal too use for book audie and introduced it to the country— Livinousar Samuel Rodman, U. S. N., Senther A. Dy and Heery D. (1984ac). These three most formed a and livery D. Hibbard. These three non formed is from and made the first managemen steel early. They also fought a long and costly battle with the older sufer makers and their serve-dove landstated softs. In which the latter low. In these of preparations had to crose around to wild next construction, which ment dield's manganese steel. This metal was used mainly for self- making but it

was also being applied to valids until about 1804, when

When Is a Safe Not Safe? THE contest between the info-cracker and the safe-maker is fast resolving itself into the old problem of the irrainible force and the immenable bodywith the odds in favor of the safe-cracker.

Since the beginning of safe-making the investors have had two arts of men to deal with—the burglers who are the drill and these who are extlinives. Each new imterrement of rafes has been met, on the port of the hunglar, with methods for avecesafully attaching it.

the military formula for formularitates because no areas and the prices went as high that it had to be importurely abundanced as a suff or formular bushful. I need hearly recount what triumples were first when reclipates selled was formularitated as a sufficient field was flushly to be had that could be gother bless nor off-field. The sell of the hall beinger was one must predicted and not without now justification. This, while the numbers of medicances as the were exciting in their victors and builty in to these shows a Propriessa agend for

op mand sever stratt, a relative of Napoleoni iron chief of police of the same more. This readers Pourch wanted nothing of us but a parent on a welding toock which was based on the idea of burning services in at alternatives of oxygen. Here we mark the beginning of a new and terrible fue to our real best Two years later a Scandinavian parced Jetrese to

Two years many a reasonable to make James to our patents on a process for cutting store by means of expens. His plan was to heat the metal to be cut of support of reduces with Fungle's torch and then in these against this but spot a jet of expens. This is of curse, the cutter-burner terch which has been used with deadly effect.

with deathy effect.

When unformations begun to see what this silvety perfected new tool would do in industrial uses not seem their effects were quicknessed by the first nitrot the direction of resistant and another their effects of resistant substances. Variets this direction of resistant substances, Variets that were suggested and tried—slags carbon used or continuous continuous terms of the continuous continuous and their substantial of freez 20 to 20 per collect of copying, copper alseless from four to at inches this is the deposit, copies are made in the state of the like it is decorated beauty wastes, and finally, narriest innerlated metals, usually a cust-from nearist still seems hand offenciety substance in the coniest. The only one of these which reached say bread explosioned is of cost from with a core of large stand crystals of the electric formace carbides at allicon, attendion or the electric formace carbides at allicon, attendion or

In 1907, the late Prencis J. Napolites, a re

In Strict, and has Present J. Napplina, a resent-mentare, themselve has one of the Entiry rate, a thin terminal themselve has one of the Entiry rate, a thin he terminal or the spatial where the terminal rate of the terminal or the paint where the terminal rate of the entire that the entire the space of an appropriate and advantage most of the entire three the entire that and advantage of the entire three three the entire three entire three contributions spaced from the three contributions and three three

of examples that evold have been foreseen a few offe ago.

Second cross the pipe receb. This instrument is the second cross the pipe receb. This instrument is the settler of Mr. J. A. Molin, hand of the research partners of the Chargede Steel Changany, who ded it to nell not the hapholos of "fromm" steel furners. It consists of a number of tasks of oxygen nows. It consists of a number of tasks of oxygen included to a long quotain for three-quarters-line leni-ptys. This pipe is heated to rechess at the end. Then the arrons of oxygen is allowed to flow through it. The red bot from fightness the oxygen, which in term borts up the from pipe as that, persenting a recheschains anyons of beat, those citally placed at 6540 (egreen Extraorder).

which is becomed in all deviations from the second of the plant of the second actuck, an improvement on and development from the pape torce. It was found by experimenters that in the

of any other terch. So the six between the control of the control

nade is a question for the future.

What reports us insuediately is the possibility devising a metal or other substance capable of resisting early visions and decastating oneloughts. It may be self that no safe now in use can hope to stand up before the more effective of these tools for more than a relatively few solution. Indived, they tour their flery *17 through metal defences once considered impr

make in seconds rather than mission.

There was a time when I was disposed to r that we metal or creshination of metals could hope to dely the power of the fercies, for the reason that all metals or allow had no be fused before they could be formed late soften, would be plotten, and what could be found once could naturally be found again. A glance

at the fasion points of vertices metals and other sub-election, compared with the heat of the export-plane faces will seem to support this view. One lone, for include, mains at 2000 to 2000 Fathershelt, shed at \$400 to 2000, incapanese with at 2000 to 2000, revents true at 2000 to 2000 and the less kind of the beliefs at 2000 to 2000. Conference and the conat 3700 to 3000 Carlorudes spillents at ser when between 4200 and 4000, siteration effects at 6000 to 4500, the oxide between 4000 and 5000. Unmitted frame at about 400 degrees, continue at 400, tangent at 600 and even carbon at 600. These latter are ayproximate figures. On the other hand, the raysestyless fame has a theoretical trappenture of 20% degrees. On the surface, it would seen that nothing roofs On the surface. It would seen that nothing could stand before such a printing flow. But here he problem of heat wants through Bandl. Baddholm, con-ficiency and meanterment occupy of a great part of the least energy of the took flows, especially when the least energy of the took flows, especially when the least weather than the surface of the surface before the surface of the surface such as can be get from own a large modern torch. The mass of notal "absorb" on greater a great part of the heat; but have used to a surface a great part for twee front of the buyer of develop materials which for twee front of the buyer of develop materials which are the surface of the surface of the surface for the surface of the surface of the surface problems.

Are We on the Ese of a Great Epic of Bank Burglaries?

DECENT defension experiments and inventions might lead us to forecast on end to bank burglery. But to bring this about in fact is not so ears. If hat concerns asfe-makers immediately is the possibility of devising some metal or other substance capable of resisting the devastating analought of the perious types of the acetylene torck, a kuph-temperature device sokich

will get its flore way through metal defences once thought absolutely improposable.

would exceed all resist these times the six high proprograms to be freed in the turn face. Here Mr. Densition re-enters the picture. His in-terest in the problems raised by the torch began, or I have said, about 16 years upo. At that time he wan trains to attack aufer with the teach. It was not lone. towerer, before his interest mend to the other side and be estammed his experiences with register materials, Newtral years ago Mr. Detailson appeared or Orizodda Chiumstry with the fruit of his earlier uggles and began a long continued seri tory experiments, preished by Dr. Raled H. McKee and Henry L. Ories of Chimbio. After some years of respects he retired to his cam interstories and there ally ended a new at of expendir trick. by was finally ship to work into mild coving, heries matrix of metal offering a high resistance to : defil the newstical conductors and the torch or well presignment metals which possess will higher revision

This respects, in the time of places and contines has within the present year best analysis on country has within the present year best analysis to the name withingstive and graviling tests in independent independent serios, which had been selected to do the teeting for invested backs, increase computer and the like. To sees of these bate and destrainments the vetter has been a witness. The others he has studied in the reports of the toeting objects—and stated with an

initial skeetisten. mean expected. The Denaktern metals have turned, these and archithe largest power delits and accessfully molecule at attacks with connectual emphasiws. The largest spe-ord worlding tectors have help talpoint quantities with sometimes in relays for boom, with the result that the states in relays for hours, with the result feet our torch the feetly melved and hardford without tanking impression on the attacked substraces. I would need then attacked with the title treet. emphis declarate for long enough to set up a 25-feet leach of pipe and exhaust a whole battery of onyone tanks. Still to result. I have seen the same from of and congestions insent to no. It was after these Decadon materials were exployed in the newly faished resits of the Chemical National Panic in New York

The succession commercian of the intention from a

minumen who wanted to describe the power of the treet, to a metalliciplet and experimenter who perhaps has found the means of definitely defecting the action treet, and butter once, is expely not the load inproveting chapter in the ing history of safe tasking and safe

The whole thing rules two descinating qu Fine, are we on the owr of a great epidetely of hosb targaries? Second, will this expected wave he the last and will the bank burnier then year out of the criminal picture, as have the road agent and the gr

goods total?

As to the first: There are, unless memory fulls, by tween thirty and facty thousand banks in the United States and among them few are equipped to withstand attacks such as are new possible to the burgler. Pully 25 percent of them were either confirm with their defeative apparatus before the treet was considered important or before such things as plue torders and og-bacases were thought of.
We must proughle that the tarch in its present sta

of development is a much more powerful tool that altrophyerine over was, since it will open vanits and unfer against which that explosive has always b

And we must not forcet the even more innerten arter of stience. Many posterior organized banks in both seasil and large towns and cities have been increme from bargharings attacks in the part because of advantageous heating. That is to say, the hattis were so situated with respect to other business bears, police stations, baiets and seeding citizens that they could not be attached with absorping collector that they could not be attached with makey explosives. All such loads become learnedistricy volumerable to the torch, which is as allest as a well cited motor. It makes no more than a bise and a shower of search, which may both be confined under a shower of sparks, which may both be confined under a hood. Attacks with the pipe toods and the representative trech, of course, produce a variable rain of sparks and a flow of britises unders metal, but even these observations are reliables when and there is architect about them to waken a sleeper in the next but ar even on the five above

To seed this extress peril there is pathing but the promise of new reddant materials such as those in venied by Dunnishen and his newclates. Granting that times new various are at they seem to be, there is this to lege that they can note that reduce the introduced danger. To insuall new terth-arest acquarent in the danger. To insent new torce-greet expension in our thresunds of expend banks is, according to experience a task which will require a good many years, even it beckers all see the perit tensedistris and act to

These new metals are definitely beyond the fining before of the most powerful factors and it is reasonable to suppose that privalency will keep peer w any people further improvement of these powerful racilly twis. On the other band, invention may at say time produce entirely new methods of attack empicyling quir unsuperted physical force. recent beneate it teat be sold that the means of failing the known two of book bengkey were to be er hand



ed not by burglars who used the acetyle teech described in this article





Power resources of the world, embedying data reported at the first World Power Conference in London

Is the End of Our Power Resources In Sight?

New Facts About This Momentous Question Were Gathered at the Recent World Power Conference

The state of the control of control of the control of control of the control of control

with the tind perchetor of the efflor of that publication.

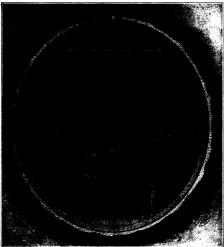
Perhaps the function of these maps most surprising to the layers in the fact Stat the text could resurce so the world come out so large saft fire water process of the world come out so large saft fire water process assume as usual. We have been taught—by the new-paper if fire by the professor—to takke of this the

as rejoined to the Nation Distance Construence, against a received to the July 200 Mingrane and design of the second to the control of the second to t

cain, in the entire world.

Some occurries are in a more favorable position.

The United States and Onneds tend all the world in
the water power reaccurss that they possess. This is
then, of corner, to the entiretion of print inspirally
ranges, providing the accountry half for elevants, and
to an angle rainfall, which provides these elevants.



This Great Tunnel, Forty-four Feet in Diameter, Will be the Largest in Existence

THE store sectional denoting represents the great intend which is sheet to be built under the Money, thinking the City of Liverpoot with Divisioned and the way of the City of Liverpoot with Divisioned and the way of the City of Liverpoot with Divisioned and the way is the country of the City of the City of the has the Division of the City of the City of the has the Division of the City of the City of the way of the City of

In table presents.

The main recovery on the apper deck is thirty-six structured and the structured and the

to be Mall, wrote in breath from 1800 to 1800 tor. In the beginning were of a such a size of the segment or a such a size of the regard from part of a such to branch, we that the levels from point of the size o

of in cases (insuch favire mentionity query), knowledge, a legalization and out of a light velocity, a suggested of the contraction of the contrac

The air is to be introduced into the vehicular section

The Story of Steel-XI

The Manufacture of Butt-Welded and Lap-Welded Steel Pipe

NOS the commodities which from here electroned for his own use but few have more excised bloomy than that of tabtry, or pape, which from trans prince with his level made in a more or less crade form of such haddeleds on the slow agrees of the unit has made available. The stems reduct, that most unclose desire for the excrement equelogs, that most modern desire for the convenient of water through a closed contain, indirt almost be said in long the life in point of satisfactors of said to long the life in point of satisfactors of the long through the life in the long through the long the locate, were, and these great estables the Rimman said selection used to said paths. It was interhable that, with the development of from samplemer class excellent asserted induction used increasingly for pipe. In the early days of tide Resolute, when love works me the very tops at this property, when the trees were few and widely scattered, we know that trees were out down, bord and wedged together to distribute the water supply of the more important towns of that period; and, over body, the old wooden player

are being the up as we sink franchations for are only in a property of an experimental property of a confern brillians. The laterotoxics of artificial gue for lighting purposes, the densard for reliable tobes for steams brillians to say notifies of the cell for pipe of lasting quality for the large installight wire systems—all these celldries led neightly to the vacanor in produce pipe from wrought inc., and we see told that the first furfree wreaght inu, and we are told find the first fromce for making both-wided pipe in this centity was made short like in the cellar of a shop at Tales and Wahnta Errork. Philosophile. From that small be plantage there has grown up the powent larger integral principal properties of the present larger in the United Street of all kinds of taking and piping overhed in 1605 a total of \$350,000 nm, the larger of the blazery of this purtrains beands of the steel industry.

Up to the period of the early righties of the Nize-

Up in the period or the early rightness of the non-rectal Centrus, souther of such special giging as was made of brace and copper, tolerlaw products were made eatherly frees arought level; for it was believed that abort did not offer the suitable welfolgs and other qualior fracelase pipe. Diving the eighties, however, was considerable experimental effort director ties for first-class pipe. toward the nillitation of size for the manufacture of welded pipe and beller tubes, although these early econd page and before those, alleged from early effects were met by the prejudices and opposition which seem to be intertrable when any radical chapter in its seem in the identificate which only realized change in in-tendated in a longest-tendational influency. In proof of this we quote from a paper read before the Engineers' Recises of Western Pennsylvation on June 17, 1986, page Mr. Thomas J. Hinsy of the National Table Company; Toward the latter part of August along 30 tree of steri were made and relied into storp, and delivered at the take works as a trial into to be reade an into The welfers at the furnior page. . . . The welders at the furness was ag me extent that it would not do; that it would not stand orbet that it would not do; that it would not stand first; said by mean of this people's supplied steel they subjected it to those by server somethering; per strange is say, every plone of that to made a scand, saidite plon, the residence researching that it; was the best material is well they had ever busides. In the centre of these labels cause in the made our

In the Other to time, resure, came to be more we. Of Beastern steel, and in here you've open-describ steel came to be stillized for the less grades of pipe. The brilliant secone attending the two of sized in pipe manufacture is present by the fact that, whereas in 1800 probably less than the percent of the wrought products under in this country was of seed, in itself; so that today well over 30 percent of the wrenger tabular products in this country are of shed Steel play in made from long strips of plate steel by carries there late chronier or talkaher form and them welding the adjetning longitudinal refers by what is known either as a built-wold or a lap-weld Our Historicks show the entereding steps in this press. The manufacture of the steel for steel olde in breefly similar in any breach of the startershing in destry, as already described in the provent series of articles. The charge in the bloor farmers, so far as for the country in the country, so for an fine ore for tubular penderts to concentral, is made up of various ores selected and mixed so us to necessary ry races over sourced and makes on an in produce the sized required. The layout are leaded in the soul-ing pits and rolled down into blocks and slale, and ing gos and review cown the season into slam, the finally like those long, conquentingly this and arrows strips of steel plate which are known as risdy. The lagest are first demanted by relifing, and while he are steeped to the proper length. They are that numbed

to the relevating furnaces at the upper and of the siedy util, as it he called, in which the blown are whole down to the proper weight, and shirtness for the size of the called the size of the called the size of the lag utilist are of the conditiones type, the blowns assis-ted as one odd of the size of the conditiones type, the blowns assis-ted as one odd of the size of the conditiones type, the following the conditiones type, the blowns assistant was of hello conditiones by the condition that they enterge at the here and augustable sizing.

Box-Vailing
The skelp for bein-veiling in change there is need to the veiling in the properties. When it made on the veiling interpretation. When it may be a subject to the veiling interpretation. When it may be a subject to the form shown in the office of expectation. The end of the form shown in the office of expectation. The end of the form shown in the contraction of the properties of the contraction of the properties of the contraction of the contraction of the contraction of the contraction which travels in the middle of a determinant which is travels in the middle of a determinant of the contraction of the bench. This clash is in the form of a long continuous like which travels sway from the furnace on the top of the bench, returning behands it, and it is driven by motors of great power. The measuret the tengs are Rived to the chaft, they and the sixely are drawn for-Elized to the chair they and the stoly are drawn for-work, and as the plop passes through the de it is funed up into a clocalar table, with the two edges abstralage. For some show of pipe the sharly is drawn through two bells at one heat, the last pass being used through a bell width is stightly meanler than the The width of the sharly is stightly present man though contractions of the ball, so that the edges are fined throughouse of the ball, so that the edges are

Civilization and Pine It has been said that the stending of a country

in the family of circlard nations may be men eared by the emount of pipe which that society yes. The home commission of a majora workman are better than empthing postered by one Emperar of Rome or any King of Babylon. mais remot is charp pipe. This orticle dose some of the ways in which this great med invention is produced.

repried to first, againey against such other, and are presed ingether little a swand weld. For pipe of extra strength the skelp is drawn accessively through belief of decreasing size and is re-basted between the drawn, of decreasing size and is re-bested between the direct, as that the same will be thoroughly writed. After being resided the pipe passes through the shall get the state of the signifiery resided in distancer and cours at treatment and the same of the state of the st

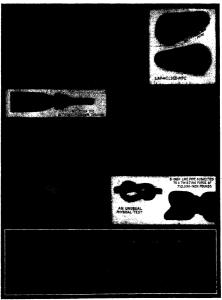
weights eath is encount by this milita, heating the pipe sails smooth and risag. The pipe loaves the last agent or nin at a high tem-perature, and it is moded by passing it showly over a table; show which it is could enough to pass through a set of convection, which aere to give abbid enough them in the pipe surface. These convecta are amountable to the pipe surface. These convecta are amountable to the states being nightly curred it is inquisited detection. Their crasp convexion surestain helicide it each other, with the result that as the pipe is draw through the rolls, its whole surface is in contact wit the rolls and receives a high fixish. The butt-walks the rolls and receives a high fixish. The butt-walks three in their washed to receive the loosened scale an pipe in their washed in creative the incommed sense gain only foreign manner, and some other have the loose scale blown out by a blast of engagement siz. The sade of the pipe are cut off, to numerous the portions that have been brusted by the lows of the welding rouge, and the pipe is then threaded and a coupling is accorded on one east. Finally, the pipe is tested by hydraulic presume which in butt-weided pipe varies from 100 to 500 pounds

Lap-Weided Pipe Althrough plays, in store of from 155 to 5 linches, in-clusive, may be made either by the butt-weiding of lap-weiding process, practically all pipe in those annular time in panels by the butt-weid process, while pipe of

from 3 inches up to 30 inches, if that due to require the control of the control other of one will in to the left and the level color of the other his in the right. By the arrangement the warf, as the sing other home the wile, as the same and the left and the left of the left and the left of the size of the left of the left of the left of the left of the size of the left of the left of the left of the left of the size of the left of the left of the left of the left of the leading or diversion. It less the provide out of the left of the l

The street of th

we retating disks, which cut the pipe, to disks at the bettern and one at the ten. The last step is to inspect the pipe, weigh and ensure it. After this is done in the case of the larger measure E. After this is done in the case of the large plan, they are trained up to the training size, litera-tive the second of the second size, and the end and the plan is resign for delivery. It should be automated that these plans, the to be introduced to a second size of the second size, and the second unit stand without beiling. The presence such is the contracted size of the second size, and the second plans of the second size, the second size of the second size, the second size of the second size of the plans size, and second size of the second size of size the second size of the second size of the plans size, and second size of the second size of size of the size of the size of the size of the basic to the skipping department, where it is under the basic to the skipping department, where it is under the



How the flat strips of steel are bent and welded to form lengths of pipe. The distinction between the two standard methods of pipe welding is shown clearly in the upper right-hand corner of the drawing



Is Time the Fourth Dimension?

Special Lecturer at New York University; formerly of the Russian University at Kief and of the Department for Russian Students at the University and Polyherizakann at Prayer

Smith? lifer disclosing of space is in new Hen in human thinking. Sow than thirty years ago Mr. H. G. Wells used it in the Haybrakes of the remarkable fore, "The Markins," The banging marking novel, "The Time Markins." This bangines maraner was what taight have less called a time herepather. By its aid the loca could travel of along the time diseased in cities direction, back into the past or forward into the future, just as now need ado-placed by which they travel at will through the time training years may there at will though the time instricts of space.

Assure the core strictly wintills spaceers of this dea the best known is the distinguished formum main-nastician, iv. Il Minkowsky. As long ups as 16th Hinkowsky cisined to have "reduced time and space. Hintering cistined to have "reduced thme and space, cutsidered separately, to shaferts," insular for the real framework of the sparial and temporal subvence only a acct of imagazithe bload of these and space, the tiling a act or imaginates total to the stri question; much as that theorists have come to call "question;" much as when we steak of "sali-mater" we much that to onlinury procedures the salted water appears us an itsupwalls blend of water old soll arace area of major and not.

This idea of blended space and than has become our of the epitanery decision of the followers of Electric to his theory of relativity. It greatly assists, so we shall see, the mathematical formulation upon which the theory of relativity as largely depends. But is in really true? Is the "parcetime" birds of Minkowsky a real thing, corresponding to semesting in the actual universe, or is it a note convenient mathematical ficgiven, and if the space-time blend in real for if it drawden which everequests to they and along which

IR idea that they may be requested as a fourth disserted quite studier to the familiar these dissertednes of square in the

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philosophes, 'Reari Polizacels, It is Bacomers, unit Polizacels, de la monta do residence the fluxes of the Polizacels, de la monta do residence the fluxes of the world is a create spike if these per no is submented to the contract of the contract of the contract of the Collect collect possibly in sally is the world-color of the Collect collect possibly in sally is the world-color of the Collect collect possibly in sally is the world-color of the collect collect possibly in sally is the world-color of the collect collect possibly in sally is the world-color of the collect collect possibly in the world-color of the collect collect possibly in the world-color of the collect collect possibly in a sally and the world-color of property cold like a point of department of a sall color and color of the color of the color of the color color of the color of the color of the color of the color and color of the color of the color of the color of the color and color of the color of the color of the color of the color and color of the color of the color of the color of the color and color of the color of the color of the color of the color and color of the color of the color of the color of the color and color of the color of in rolation to each other and to the mind Just so a serveyor setting out to make a map of a zero country chooses a mountain peak or a full troop of law equatry choose a magnitude peak of a null tree or note other incidents. This he makes the center of his map. All other objects that he runs across see not down with reference to this. Apple, an orther painting a picture example point it in the empty six. He sums

to payers remaind paint it in the empty air. He issue first get a about of payer or a square of curves of which to place his payer. That when of payer is his "frame of reference." roumple is that of the poets riera ng mail in the post office at some great railway tion. In frost of irtu are hundreds, maybe three is, of boxes and names hales. Into these he thouses one by one, the thousands of letters that come into his hands. Just an our roled in receiving every inclusiinstall. Just an our right in receiving every means hundreds of sense increased us that we may call "forces." If these recent unscend we are ideals. We are to If these breasts susceed we are idiatic. We are so behighes in the free of the world as the penal offer world be if he for a five world be if he had to take each fetter by Beef and carry it is in destination. Accordingly, the sizes the energy is the size of the control of the size of the size

We neverther obtains catalile correction, for the m part, 25 two ways. One is by the ope, the other is by loads. The visual Ingression (except for the last deatal and later idea of perspective) does not carry say like of depth or distance, that is of space. 21 is American that whethers to the western described North Assertion, where the let is very clear, and prime to ablewithout distallation and its red off to result in the least which is really thirty or farty sales away. The eye is an uncellable guide appeal an alternatives and the origin of the idea of space and be secribed to it. at he ascribed to 31. He origin erget be ascribed to the other wasse must

This origin stant be ascribed to the other wines motioned, the ensure of tooch, for rather, it must be northed to an outgrowth or accompanient of the secret of tooch, a same that we may call the Presente or "dynastic" sense. To locate an object in space (if it be within our reach! we may take it with our fagures. To do so we trust more our arm. It is clim out which gives on the follow of distance. This cut, and thes like it, develop our mencular when They are

it is quite probable, for the creation of the al space or lody is an extensional and the relative mot to which we are arrestanted have each welcome that the more On movement of our hand to enter to book securities, a boost simply described on a source found; described on a source found, second, forecast or sidered. All other notions can be observed as or sidered. All other notions can be observed as the second of the contract of well of our hand in order to break wend hing of ouch. We have built our metal places being that is, in the ferm that we call three-disconnected

This may all be dependent, it be well to point out. on the range of relative speeds that we excussive here on earth. For this range, of speeds—from new up to your allow a world—the printing them believe but the figures Newtonian Lower of Motion use a suf-Sciently accurate description of phenomena. The Laren means three-discretical space. If the speci The encountered on each in sedimary leman experience had been many there so great so this, as good, so, so the stands sesseds of fifty thousand or a lensing world after a world, we probably notif and in here while to held corrections this to relevan these literaal reference frame for the facts of the world. facts the needed we made have told us, long stars, that the frame was wrong. To recorn to the simile of the postal clerk, we would have discovered that mean of de prieditie post offices more left out of the frame. These would be its originismal letter for which we could

find no place. Had no place. Our idea of space, then, has nothing final or funda-mental about it. It is movely the frame of reference (see a part of the frante threshown) which we have built up to stable us in shet out the making of some happensham that much us all the three from the out-

artially dynamic and managing. If to reach two objects in the outer world so find it necessary to execute liferent was of mescular measures we say that the no objects are quotelly distinct; they wenny different places. In space, In this respect the about space is provided by the eye alone, may be different from the dynamic or muscular space. If we look at two the Officials of manageries space. If we look at two hiperts which new in the manne through live; for example it a piece of glass and at acceptability the lated it, and if we can only come one architecture are led the possibility of perceiving relative distances by the reasoning-indicial action of our two tyes, we cannot distinguish the two eligicite spacially. They will seem to occupy the same objects specially. They will seem to secure the man-place. In the visual space-lifes that is given to us by this kind of one-specially large granule or mescales. We will have to call it, our granule or mescales.

in our consiste three-finene

securimes of such uncertainties in real life is avaided in most cases, by the fact that we have two-eye vision and secondingly an approach to a three-dimensional frame of reference for our visual space as well as for our passession agone. But concatenately, we in the inour muscular apone. But occasionally, as in the in-manuse of the violate who under-collisates the deser-distances, this two-eye agent judgment breaks down and thus our viscant space and our associate space par-rangency, semestime with consequences that approach

The lessen of this is that our space judgment our whole like of space, depends on the particular wave that man has used in the rest to look to be space ties. Three-disensional spee, therefore, na-quire sady have been the creation of the physiologies quite analy first back his counted of the payers and populational character of man, which is the that we set out to retablish.

To relations this idea still further—for it is by a are the complished to prince—it is contential to coupled the decire that we made so areas are of in the present and the contential to coupled the decire of framewile, insightery creatures where writer providing, worked and fraction of reference are concluded to the very different from our own one of the coupled to the very different from our own own. Let us condider a world consessed of conductor wh the interest to the discussion, the delegates of the of the delegate. These consists can see about at vit it the flat plane that is their home but they cannot now at all in the third discension above or below this plane Purthernore, they consol be best, for that would in votre marring were parts of their bodies set of the plate to which they are restricted But let us grant to these two-flux a three-disconfigural eye. They out his up, we will implie, set of the plane they live in into the space above them. They will do this even pure fundamentally said, thus we look up at the stars, for our eye has no

poer discretional pervisitors than our materies ha excited actually feel the staps, we broughte, if but we had a long crough arra. To the paper-doll cocount vision is different. It is an elemeter distant for thing free their tree's warution that are conf. to the plane. It is so though man discovered some day, so indeed be may, an additional sense or some invertisent that could powerate the fourth discusses be it than or he if not, which fourth discusses see such in the reality as a still invidio aspect of the

New investor that there exist in the paper-doll w of our imaginary flat plane two fixed objects; one in the plane, the other just above it. The paper-doll consumer would are both of these, but they could feel mly one of them, the one that by in the plans one of the served one selfy would they have any "span conception." They would believe, therefore, that the two objects occupied the sense space but that one of then was so constituted that it was impromptible

that the two objects differed in wint we call peoporties. sears. We will have to reach out and boach the re-objects, before we will be able to place their property It is precisio, we may purse to note, to regard in the some way the common scientific theory of the multiferent either. We say that this other securion



of it, above it and below it. also from this surressaling



te the possibility of

And, exactly as has happened with the bles of a hand on our proceder some, as the lifes of time based on this physiological time some has been built into the solod's frame of perfector for the world—ten time set of piped hele by which we set out facts. It is no teach toughly for the mind to invaring things outside of the thin it is for us to imagine them entitle of three-dimensional space. Changes "In time" must occur, nervasatig, to objects which exist, we extend to in space. Conversely, if an object "school" in space A more straight-line fonce will keep the two-dimen-sion daily spart. We three-dimension creatures pers straight-line fonce will keep the two-dimen-on delle apart. We three-dimension creatures ujd jump this fence, thus crossing it by passing to the third dimension of space and back again, se dolls cancel enter the third dimension, so the but lasts for no time at all, get even the abo trackent, we refuse to adject that it exists at all. Every plended event needs for its description a perfection of the point in space where it harrows and They do not even on of the instant of time when it largers. If there two data cannot be supplied our mind begs the question by teralos es nes

ted tate our setad's loss of the world Let us imagine

The dalls are able, Dr. Rackersay assessment into the third dimension, although they cannot potential it healty. Accordingly, the small pastelon wanter raised above the surface of the plane seement of the plane and the plane are the plane a s. to see from the ago and in the pla

the same space as other holles but that it does not affect our senses. If there be usy such thing as the other (which is, of course, a marier of dispute) we neight think of it as bring situgation until the three spacial directeions which compose our reference frame. Bindy perceived by as in other ways but impossible of being fitted this can ratial's loss of the world, this either may be plotfur, we bissipe, the same rule with as that the second-certenid object, seen but unfelt, heavy with the second-certenid object, seen but unfelt, heavy with the lesson in that space perception in morely is satisfied to design the processing. It is a matter, that is, of the physiological constitution of the preceiving. Let us take still another and more stricing example of how completely this dictum against Let us imagine

of low configuration account appears for an amount a hind of creature who cames come at all and who passesses, accordingly, no assessing some and no space-frame conditioned by this sense, as we do. But in us great to these unfertuates one means of contact with their world; let us insigne that they can perceive order. These are the only things they do perceive. color. These are the only things they do perceive.

And let us innaine that the colors of others in their world consist of the seven primary colors and of vari one minimizes of these seven. Hash creatures would be compelled to choose for their frame of reference-dust "many"—the color hunce-

They would have nothing else. If two objects were of the some color the constants sould titlak of the roler of any object would be determined by the relative assessment of each of the storm princer colors which it entialized, the "space" of these color-perce consistes would be a wron-discussional space. security that the even is "coresi" or "long that is that it pover "becomed" at all. If each creaters welly extend in the world as we know it. It is apparent that their likes of the worldthat is that it here? "Imposed" at all.

Thus the description of any real event requires four independent data; the three dissentions that for the point in space and the additional division that first the point in space and the additional division that first the point in time. The gashay of the time damps with their frame of reference for II—model be ridicalously different from our own. It is north while to remembe

that our frame of reference, our seconing fundamentals of space and those tray by just us ridinal-mady different from the viewpoint of some constant more sixtly on dawns with sensor than we are. It is impossible to it is immediate to any that one of these visuopoles is "right" and that another one is "record." They are userly different. It all depends on the science possessed by the particular creature who is delay the proviving and who is con-struction for bisseric this particular "bear" and, it ay be added, his particular "time."

Torning to or to this native of time. It is recovered

on a little constitution that it, we be detected by a fact of luxum physicisty. The human holy is, among other things, a chemical rechester. Chemical changes go on in the blood, in the bady cells, in the carry cells of the brain. These changes are what the chepter calls "irreversible," that is the condition of the cells or of chemicals in these is not the stars after the change as it was before and extrer by restored to on condition by reliant subtrail tourses the portions condition by relitary natural possesses. Takk of a takk of dynaside. Resolving happens to make the dynamic replace. What has happened in that the millions of millions of across in the dynamic have down mark. That he is preventible change. It he be possible, theoretically, to collect all those tered millions of atoms and to put them buseless

the point in time. The analogy of the time dermy with the three-space date is an electron one and then the purely mathematical point of view it is quite possible to text all feet in the same very. Mathematically, time may be reported quite approximately as the friend absoration which is, indeed, enough what Mankowsky and Me followers have down. Thus the graties at the "quest-time" of from-distractions what Mankowsky are the form-distraction when the time-"questing" or foundamental world which we me-tioned at the heptaning of this anticle.
This throught has proved an equelatly storyle can in the healthing of the theory of relativity; which theory outside, it must be represented, of each com-plete and inproves nonlineasited reseasing that all question mathematical simplification of the data for consolid household.

especially havesury.

We resture then by somes of clocks and all clocks remain. It the last analysis, of some artists which reports itself at regular intervals; as, for example, the relation of the earth, this lodge the great standard clock for all the world. But if the species of all events clock for all the world. But if the speeds or an events include any pines askers after by the more degree them will be an way to perceive this. If all the clocks in your brown and sale to the same degree year well knew worldes of it total year po out and total at another deach if all provisions in the trishle anisons were becoming delicer faster or alsower three world be to way in that December, 1994

it opt. We would have no mandard clock for ever purious. parison. It is one of the tenote of the relativity theory that the upith largest and that, in fact, it sail depends on the section of the cutter that contains the clocks being section relative to the section of the observes who incurred there by those clocks. Topother with this assumption, the relativity theory make statcher concentral the change in proceedings as the bottlers as

assumption, the reducity theory value desides the amount of the control of the co chosen as time.

chised as line.

But there is one serious trouble with this point of view. It heaves cut must. And a "time muchies" would be of little use, howardy speaking at least, unless there

he of little too, horsely speaking at least, where there were a man to risk one-clear to these and space first an interest operation where the first discretization in interesting conceiling whose four discretization are such as the contract of the universely and the north students. See in such students for manhearistic interestant than or more familiar plan. This is quite true, We do gain in singletty—desire, the object of science—if we are describing certain leads playful phononous such as those with which the relativity theory is a expectably. conspensed to deal.

these with which the relativity theory is a security. The ER is provided to we will use in the relativity in ER in ER in the relativity in the relativity in the ER in ER in the relativity in t

are indistinguishable.

With the progress of science we may be able, a day, to do this: to find some more complete some per (Commissed on some 445)



igh illustrates what the cre might consider to be an an id above the two-dipsensies



Fig. 1. A diption (Distance), the distance for problem for the latest actions, and conserve. The 3. On the smaller constance. Described, he increased described in the first of the latest described in the latest described in the latest described in the distance of the latest described in the latest desc

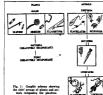
The Basis of Aquatic Life

Some Significant Phases in the Study of the Plankton of Lakes and Seas, and What They Mean to Us

By Dr. Loss Augustus Hausman

Insula Institute of Insulan Insulan Insulan Insulan

Total



on extilia faceal for the large, but and transfer in the second form for the second form for the second form for the second form form for the face face for the f

form the chief foot of many species of the control of the control of the life of the spec union we did a secting of creatures which is self-environment. It is establish within limit all of those ofthe control in any complete and self-perfecttion of the control of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the control of the section of the control of the section of the control of the section of the section of the control of the section of the se

8 intelligence of the control of

interfacilitie an adjustance. All this is very interesting, yes say, but is it of inspirators, of the greatest importance are only for in the blocking science, but practically as will. For in the entry of plomking we are considering a group of constraws which forces the basis of its entire life of set was small taken. It is the great feeding ground for fidus, or for these forces upon which the falses

for those forms upon which the fishes depend for food. And the fishes, in their form, provide the accounty food supply for the aquatic mannels: the wells, whales, porpolars, and others. Elizabasis the plashing and others. Elizabasis the plashing and all aquatic life would cross to be

to be The tributest of the plantism, the fermide, distributes, and goven flaged as the cardiover of the up to the cardiover of the up to the cardiover of the up to the cardiover and the tributest and producing food for the bertiever. Smaller force the producing food for the bertiever, Smaller force the upper tributes, it is the greater that the tributest of the owner in testing. It is thereweith and have been tributed to the content to result the tributest of the content to result the content to the cardioversity of which we have not pre-

The second is regarded by the second in thes

About of these are identify, were administ. By the property of the property of

the coil, and there form the depending as a fifteen service and the first deposits, when ride is silled, as they foresten when ride is silled, as they foresten in the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the portage of the first of the plants of the plants of the portage of the first of the plants of the pl

tavariably present when engage forms are to Little is known at the p concerning the planking The role which they play in the life of the open unterin probably, shaller to that of the terms with which we are familiar in the province of decomposition. Softher the plantice factories are the family appear to be of much importance in the maintenance of plantices.

of The estimate of the platation are chiefly the personanmental properties of the properties of the properties of the commental properties of the properties of the attent that described in the describe and distress. They are extent, understanding forms, and are possessed of more factor defined moving of incomments there over the properties of the properties of the properties of the beam are offer and the properties of th

* PSA

Fig. 5: Some of the annihole of the plantices organisms, represented as lying upon the shall of a beams hale which is apportunitely 50 micross in dissorter. 1. Fingeneral 2. Structures. 2. Structures. per thank matten organisms are vari buted in the upper atoms of the

water. Light is, of every, the control-ing factor in their distribution. Hence we did the majority of the species next the surface, say free about they feel below the top to many two or differe feet below that, the distribution varying with the clurity of the water. Plotskow-are frend, in some localities, honorest, are read, ill none totalizes, between, as far beginth the serfer as stuly of series; feet. Traperature carrix likewhen in infinery is planters disprai-

the. And curiosely strongly It is not be the implical was that one finds the richest and must absolute absolute life, but in the miles often! The plantante linemeters are virtually anable to regalate their dispersal over large tracts of water, for allough many of their are provided with becomes amendment and are couple of tulming and directed improving the two opened is consisted that the con-mentions, bushows entired the core is now through the of it titler defection act and serves to now through threads comparatively adende disbursers. They must have adult, and time seek their optimizes levels, but are dependent upon their, which, and water extremi-

head proved distribution The more physical quantity of plantation life conin any given volume of water to surprising. It has been estimated that the total light of such life in an average lake is probably equal to the total light of life produced over an equal area of an average land

surface.

In sits the ambetty of the plantionist are so small as to the below the range of cloim of the amounted eye. The standood of the focus are the barteria, which gye. The statilost of the focus are the barriers, which are that the process of even the best of any modern micro-scopes; the lattest are the evantures. Brazily, the same the following the station of the process of same the same than the same that the process of the Posteronome [Fig. 8, No. 13, with a disaster of from 2 to 0 olders (No Hantson, L. A., the Semilier Ashmal in Keldersto, Nozemur Asiana or Hantley, Mos. 1923). The introd is the Leptoders, a conductor machine as both or more in length (Fig. 9). Engineers them, at the betterin, the market organisms of the phathton at the betterin, the resident expanions of the plantics, are the dispetche periodics. A group of these is absent in Fig. 8, represented as lying on a weaker of a horsest last, which is approximately 30 salers in character. The advent, the sale of inferencements, in 17900. The attent, the unit of mirro-construction, to 1/2000 of a mind.

Upon the back of size the plenkroute have been divided into two fairly station; groups. These whall stree the narrophysikes and the mirrophysikes. shall term the amerophishten and the macro The fermer are wendlines called the me

The former are wendless colled the net pursues (since they may be taken with a fine silk net) and the latter the nannahoulten (dayed absolute) replanting are these above 25 mirro in direct; the interpretation there has bee (Fig. 10). The group containing the microsingists in he for the larger of the hoteg, by wright, on the average from there to on these or greet. In this group there occur chief, the hadrets, some of the signs, and merty all the familiate protones. The study of these mixing forms to used difficult, and calls for appendix and manipulation of re-trems shorty (see Hanness, L. A. Tho-Manipulation and Identification of the mempanents are investmental of the Mastigophora of Fresh Winters, Am Nut., vol. 54, July and August, 1920;. Whiten the mempionships over the mellow, crustaves, and the larger describe, di-

cruatives, and the harger describe, di-stress, and processes.

The marrophetistic are positively taken with the planties are (Fig. 18). This is-exapped of fee bothing 180, and when drawn theorem the stress or ap-processing from 25 to 50 per cent of the organisms in the column of water which passes through It. The plantates not in-tensed belieful a loof, and the depth at which it invote can be regulated either by weighte, or by verying the speed of the load. At internals the set is basiful steerd and its contents rinsel into a jur Or the water may be pumped through not either by hand or be sundreavy. The latter noticed of securing plantages to onphysic where it is desired to corry on investigations of a quantitative met over





a large area. In the ocean metal to exceed in temperatured rates, in order that they may be drawn at rather high speed belond steamers. Nature

ren. Xu on undificultate of all of these derives are to be found Turbes laborated For the restors of the relevalations on assembly Attest as the water-bottle in seed large, enail-mouthed finds attached to a rope. Along



the rape are markers spaced at the inherent of one fore, so that one may know accurately the depth is which the bettle is lowered before the sample is taken. When the desired depth has been reached the cork is pulled from the bettle for a recent roop, and the bettle allowed to \$50. It is then withdrawn, the sample bettled and labeled, and is ready for the collection of another sunpår from a Øfferen depth.

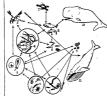


Fig. 11: Over showing the all groups of food supply, the arr

d the largest—or, at any rate —of living plants. Thus th burteria must at one extracity of size and the giant kelp (Marrayatis) of th Partie at the other. The letter has been

own to reach a length of 900 feet | And h the reception Littlesetter and the vegetablehe found as near neighbors in a labitat.

Can we existence pleasants in our labes! For if we can, we can also cultivate our rapidity decreasing any ply of troot-same table foot. In many of our smaller inland belies of water a case replies and important supply of fishers how failed, or in failing, and claimly become we have allowed politics of the water to take the contract of the

because we have allowed pollution of the water to tak place, killing seatherly or growthy redicting in member the messives of the plantion. The first step in the re-portation of our depleted waters is the calibration of its plantites growths. Hooking the water year after year is further unless this be done. It is because of this very infinite redulinating of the contract of the very infinite redulinating of plantaneously with our sepect of our conservation of as important element in our food supply that this com-pensationly new field of study is receiving the attention of students both of negatic blokey and placical

Attacking Malaria With Airplan Attacking Manaria Wam Auspenson That Hall Hall Sections. In Federal Institution for Institution and Mound Lesisions, a few sales from Taillaid, in Federal hand and the Australia Control. The same six

Louisians, a few adies from Tallalah, apartees for studying realists control. quarters for studying restorist control. The same are planes are serving both these stations in effects to prison hell wearth and manualties. The larve of the malaria mangation is succised back in the water where it is bred. Hereage of this freeling in the water where it is bred. Heretone of this freeding, habit it can be enlarched with potent. It has been flower, that a pound of parts green can be applied so us to effectively creat 20 series of seating. This has been deconstructed by 1r. W. Y. King, who is in chap-les deconstructed by 1r. W. Y. King, who is in chap-le and the structure work of Monoth, in this demonstration the potent was, however, just on with a land mandals operated on the ground. Princ 30 to 16 present to the race are approve record at the interest of one foot. the larter of the malaria mangatu was billed by

Tredizant. The indext the potential dust particle comes to rest on the surface of the scaler and before it has time to stake a mongaire larve pounces of it as it.

It were food, with the result that it gets

it were food, with the result that it get he fatal does of poison. The fact that malaris mongriss larve could be poisoned larving been estab-lished the question arose as to have it spread poless over cyprus awarage, most fasts and other linerestile pieces, the ower to which is being sough

ensewer to which is being sought in the use of the singleism of sirplane bestime has now with millionst success to hald out out with millionst success to hald out of the captus swamps does agreed by the sirplane personness through to the water in sufficient quantities to cause high mor-latily among the larves. More poison, of course, in required for threated swamps when the course of the course of the course of the course, in required for threated swamps and course, in required for threated swamps and the course of the course, in required for the course of the course o plane polesting imprecipable. the mularia mosquite is because of its distinctive for

red to determine the most effecting out to determine the most of also to learn if the te than are now being sale into than are now pending our ing. But enough has already and to enoughput the belief than on many corry "booling in their w the chills and fe

Inventions New and Interesting

A Department Devoted to Pioneer Work in the Various Arts and to Patent News Conducted by Albert A. Hopkins

Don't Be Shocked THE denger of getting a serious or faint whose if you work around elec-tric election of any kind in to Juke. No tractor how old a hand you are, you are



always in danger. In fact, if the obase that "flamillarity beeck contenge" still bodic, you are note think to far it' cla-lenger you skay in work of this sect. There is the role to keep one hand in your pocket while dotte work of this sect, but like stange suchler raise this one works out quite well for the other for-len. If you do work of this sect you to meetly have to use both hunds.

A Newark, New Jersey, manufactures his provided special raidor, insulating planes and shorter for the purpose of projecting electrical workers from shork. Doughting electrical occurs to lengths from 11 inches up to 18 inches lengths from 11 inches up to 18 inches long and are designed to guard upsited various solvages ranging from 3500 to 13,000. The slevers go on over the At the rater and there is a greatest at our offer end more is a greenest and hele, so that the electro may be find on by means of a rather held, pertitling stretch in work.

These sleems are this substret to the

use of workers in sold as well as in electrical work. For the latter use they here all the electrical and mechanical staulfestions resided by the N. E. L. A. relatives that on departs 30,000 water



we may apress, more come officially in the otherstone which is the interest they make he lected and properly that it treeble is not to arise. By when a small amount of vibra-in noted it may author be predicted it will increase break. Occarityzai it will increase break.

force varies directly as the expury of the triadty; therefore, even an extremal shall utilahand saight will, when set provings at the blak missiles of the stress britise, at up stresses that are unparathely high.

The observer is a delicate ingra-real for encloing up inciping elections is modifiery of the and affed kind.

By its use the source of the thination

may geterally be heated. By design is
based as the total vibrating real principle. In sucking observations the reed in taged to respond to the particular tibrathe under exemination, and great sensitivity is time obtained. Means are provided for turning the independent along lath its vertical and horizontal more till the maximum amplitude is frome, the angles being indicated on the scales provided. The weight of the in-

strauett is two pounds. stranged is two postels.

Referring to the illustration, the long, stender uttracting root which shows in durier point applies the estimate it slightly leaded at the free and and in

Chassis Offing with the Gravity-Capillarity Wick CHASSES intrinsica to a vesting profconsidering along it with its new ear and not encounting about it at all after the first thoughted ratios. That is after the first theoretal taller. That is use of the remain why sharkly belts are always repressing and wearing out, ference and all make fire belt-least of they are regularly supplied. It is very

they air regularly supplied. If it corp to keep supplifts grown to a presencion less it he hander to began that it will always he on the sore spot in the rule This is especially true in cold weather A Chicago insendicturer believes in his solved this problem by Stellar as practical way to heep off-mic grane-in the shackles all the time. As slowed in the Maximilian, fight is during the security of maturated winds which equality states of militates using their equation safety ply and demand in the oil huntres where it comman the energing parts of the change. When you fit these cope greatly free finales the bearing clean; their expillantly commys oil should be imagin

it is righted by the put

three effects will keep all going to the right place for 2000 salles

Chicago to the Rescue

N cups enck parts, but reveally there has been an impossible of rall for share

letter for expertation to Class for took ing Mah Jong serv. Surk benevate ner

used it contection with betalen to ferry erd IR consection with betalen to beta to "tilen" in the Meh Jong ert (Talma they not have auto denomic

minute and, therefore, to not able to apply the over horosotting drawnal

DTDESC Is over wasted at the Chi



clarged at its lower and in the jews near the base. The morable spring classy wides friction right on the pillur not the burn. and curries a market executing over a and curries a marker operating over a sonic. The pilitar can be set as that the plaze of whentiest of the need is in any angular position, which position is just-cated on the sonic at the lower left. The

Instrument is damped to say retriveled tact of the markler state and When the sliding leading on the piller is in the right position so that the reed is tuned, the frequency is read off. Berth-ed different thickness may be used at different awards, these trade this sale-

quiete constag the name from 300 to not of a Glasgow, Societal, numbering and appears to be as confully made as ligities tradition desireds.



A Useful Floor Lifter for the Handy Man Around the House HAVE you ever had to rip up a see ing? Was it is pleasure job? I bel you not wish you laid a larger chies then



On this page we illustrate, his such a chied, but each an implement having a five-inch blade. The filtutration is about self-explanatory. Single insert five-levit blade. The illustration is shown self-explanatory. Simply fixed: the blade between the thorboards and use the humaner. You thereby call five-inches of bugge at a time. The temple-ness sevens to be leavely unde out. Electricians, expirations and other trade orthogon, but to mank of the hands way need the kees, for such a tell wey need, it speeds to work and ways, disposition, for no one likes to drive share chiefs against galls see

This tool is some by a New York Ice Cream Freezer Stops Itself When Cream is Frozen time it offer railway track formals A N electric les ermen fremer with so time in offing rathers track formals. The entries destroyed and naturalists, and current when the content, are from to the degree dedred to the device pictured



A freezer that atops stack when cream is freeze It connects to may electric lightless electric and freezes from contact in

sown admires and few cream in terries The exert can be recollect to meet the precise requirements of its contentupor set, it mechanically perform Note that the audor and the cross are



A time-maring device for lacing up the fowl

Automatic Lacer for Fowl A NOTHER metal and time-earing de-vice to simplify incorkerping in an actionatic lacer for senting the first to-gether to keep the dressing in. Grandwother had to use a needle and a stout thread, a meany job at heet. The podern benedarper mere's inserts als minus plus on which the string is laced back and fresh. When the first is distrito a turn, the willdrawal of the plan extensifically releases the string.



A Toothbrush with Acc Bristie Roots A STUDENIC device is the tooldicash sharm on this page, in which the roots of the bristies swing out from the



In this design of table accessory the pepper and salt container, usu-ally made separately, are welded together but they can be used in-

elitating their thorough chessing and flushing with water.
The brush has there reses of injection each of which swings out reparately.



A Trouble Light with Interest-ing Features THE trouble light shown in the pho-ingraphs at the bottom of this page is plagged into the sector of a bondis progged into the securit of a book-light, tall light or dash light and a two-foot cord makes it possible to use it at any part of the cart. A heavy spring ofly makes it possible to fasten the light orp master it position to make the igni-to any projection on the car and by this issued both hands are left free. Subject taking planed on the city pro-vents the pellabed surface from betwo-



A quefal device for charging films or plates, or to take on trips away from horse. This may also be used as a forming circh

Portable Dark Room for Photog-makers A BAG for changing plates or films in A n useful device for home pertuals work or to take on them. It is made of a special rubbertand material and when foliate all fit little say caseers one or the caseers may be wragped The photograph on this map show

low the bug sign over the head and -forest several the water. forest arrend the waiet.

The small square is the ruly light for slight or night week. It is starty-ett by thirty-ett larbes and may also be would appreciate full particulars and used as a Sweeting rinch.



Landing Lights for Mail Plane "NIGHT HYES" for plice flying best installed revenity on all planes have been installed revenity on all planes in the western division of that branch of

cur total section.

The new lighter are placed on the en

of the lower stag and are of 450,000

existin-power such.

From an airlitude of fire handred feet these lights light up landing space for an area of once half a sale, and are an

slashie ald to pliets who must make lundless at night

Felling Large Trees Baffes Inventors

THE Mg trees of the west have so for heffed all effects of inventors to supplant the oldrier "burker"—the streng armed sun who saws them through The tree shown in the photograph of the top of the page in 220 feet highon tail on a twelry-every beliffing-end the first branch in 150 feet above the Provend.
If any of our readers know of any mechanical device that has been used successfully for week of this kind we



Two eld-time "buckers" cutting down one of the giant redwoods of Cultifered

An Electric Melting Ladie An Electric Belling Labor
THERE are many industries which ye
quire more or less constant use of
method materials, such ast battery compound, habitis for bearings, wax, etc.
and, in addition, there are thomands of
people was secusionally use them on
small jobs of various kinds. Keeping



deal of a bother and diverse once mine and energies from the work itself Under such direcustances the electrically





The little ladie Statistics on this page is manufactured in Philadelphia and is designed to be highly until Mooree designed it evidently quest considerable line over details and had an ope for mattern as well as utility. The bord is of allustication—describer, it is light, finding and in the constitution of the constitution cilitating careful pourtage



The lamp is easily attached to a fender or hamper



The simplicity of the lamp makes it useful in many places



окторы.

It is possible to turn the long to any desired direction



DECEMBER, 1924 SCIENTIFIC AMERICAN



A shope that fits any job

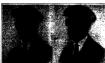
The Adjustable Shore for Concrete Work

M ODGEN controls helding construc-tion requires the fitting of money shares, in order to held up the forms. shares, in order to hold up the nexus. The old method of dring this sect of thing was simply to the two-by-form, and to wedne then up. Of course, they had to be cut to the width a quarter of ma lacts or as and all in all, the wasteof titaler and labor was great Co-to-date cratturiors now per current adjustable shores which are as givel in one place as in another and can be ad-justed to fit in any place within a few seconds. Such shores are set up by jack, so that the right primare under t, so that our right primeter waser forms can be multivized and augging



Scortalies. The store consists of 2 wooden frame and a cylindrical iron tube with automatic lock. Such a shareillustrated on this page and its sinplicity is apparent at a glance. tweet, so that 14 feet is the extreme ex-traction combin. Ther with 65 persons just a sire shoulder load for our man. They are so simple that green laiver can





A simple device which cuts out the place of approaching heaflight-

work them, and since there are no issue parts, the util: ren be book together in site of careless nuckmen.

The jack contains a grip of the pape wreach wert. This jack is not meent to be kept with each shore, but rather to be attarbed to each while it is being be attached to each while it is being adjusted. The jack sizely does to jacking, while the jawn of the slowr keep on holding to the rod after the jack is eligated of. stypes or. Dee there are many places beolden controls much where there shares would be found to be involuntia

Do Approaching Headlights Dustle You?

Datale You?

If EADLIGHTH dustic most people, and the worst aspect of it is, therein lettle that can be done about it. for the rush not fair two compared manufage for each driven to settled off life head-lights which approaching another car.

Mr. Frederick Indion, of Etmologister. no. orederics theme, or mentingless, Raginal, his selved the difficulty, hore-ever, by applying to an ordinary spec-tacle frame a small, thin shutter. This is attached to the eye that is fricthed from the passing car, which in the case of Great Britain would be the left eye. On approaching a cur with healthful shet squared) at you, simply term your lead a trife until the eye is in shadow. Then the road may be seen as before. The other eye may be kept upon till almost the last second or two-ee you our close it some. The whole open ing per in he served seture in a few

team. The draice is so nimple that wearing It is not incomment, and its use save s great deal of eye strain, for the eye etherwise keeps trying to necessariate itself to extreme brillinger, Sollowed by the reverse.

may to have ft-g pew defew taux-factored in the general image of the regular gas but-water beater. The tank of this heater, which is made The task of the heavy, which is about the Creekend, Ohio, is dealify tandared, awaying the heat inside where it is watered and thus turning it has a non-servator instead of a maliator.

The heater is postded with a ther-mentic wholed. You light the borner and farger it (you geterally do any-way). Then when the tonk is full of but water the thermosts automaterity turns off the flare. Half as hour, prcoefing to the munifertures, gives an shundane of water for a both The larger is one which, it is said. four million women are using today it oil states because of its circuitions and dependantity. The ten adjects on right and left are oil containers leaving ongallen questir earl. The start tank itself ladds 30 gallet It has a boilest conter which because the seizel, 25-feet overer heating cell



telly interesting because no ri-State are used. It consists of one stage of patio frequency, detector, and two stages of andio frequency but, instead of the treat chemists substatic problems are

Any kind of takes or "A" hotteries may be employed with the many redo-As the modern road in radio is to ridger the number of controls this set about he of special interest.

tools, the units purpose being to speed up work and take the place of help that is no longer available in numbers as was

one the case. Here we see a mortic sterly interesting application of this sect. This bendy little test is driven



in place of the new, as abracks man be seed if desired. The saw man may be used, if desired. The saw may be used for a large number of staterials of wide variety. For instance, there, bulering, sheetrark, wall beard, asset, bulers, requer, lead, siste, hard rubber

407

and hander. In bard pine this new will either the or crowned on an average of two square lackes a second, according to the civitus of the augustactures.



This beater will fit any o eggs or whip cream by simply point of an and down on the hand



THERE'S the cid tale shout the unscrayalons dealer selling the farmer's wife a gas store. But he couldn't sell her the tecessary gas. Yes dual't have to live in the country. beween to find use for a kennense lot-water hauter. Orthagers like het water as much as do tennapropie. There is a

An Alarm for the Befrigerator Pan

B's simple derive the problem of an overflowing freebeg part in at other solved. All that is necessary to be aftach this slarm to say you and when the water rises to the level set, the first to which the slarm bell is startled by pushed up to the point where it will start the bell shaping and those give angle warning.
The past can then be emption and the

algres presented to set us a routeder of the peat occasion. Another Micrometer of Interest ing Design

Faw department rate of tool meanfacture show so much variation between the work of individual designers as is to be seen when we compare the various micounters that are to be franci on the estimate being. This tool figures in these columns of interseting inventions about as often as any other, and this mentiwe present it again. It is from which will actuat all who are interested in this tool and its applications. The issue

this tool and its applications. The iso-tiquiar assembly illustrated is get up at a cylinder test gage, but of owner the same general design could be employed for other purposes. The photograph is for other purposes. The paragraph is one of those tire one which so con-pletely shows the manner of twing the tool and the way in which the tool does its work, that it issues little or nothing to be said textually Increases Ice Box Space

When these glass too bex divised like the strength of the street of the strength of the streng upon the other, as they are designed to be used, they will occur but built the space. Early dish has a glass ridge at the top upon which another dish is to rest. Ventilation is provided for by a small The place is the take-in-the-even kind

A Pendulum Viscosimeter EXPERIMENTS have revently been Beyoning (Flat. Max. March, 1934) with plates affired to the bettern of penditions, and so arranged that are the penditions aroung decreased the places dipped into tanks of field. The places were not rightly joined to the pen but hing investy from them so that they could be returned, independently of the penditions proper, by the resistance of the fluid. The results were sufficiently occalebrat to show that it mould be presible to use this method to concret a risconnector (apparation for apparation viscosity), and that, by softable caudeignore from the sale the assertion

could be reade to deal with a wise temp of stanualting A Substitute for Muffers on Motors

THE California Tractic thereary has taken of mathers from their waveful-fung makes stages and has thereby edited this part of the stage in writingly ontriangular-siaged attactment per on the and of the exhaust nine which has been found to make the search of moters to on entirely satisfactors manned.

As shown in the photograph the al-tachmost is a short sevent triangle after it Judges by It linkes plain, which changes the cross sertim of the extense that from a circle to a rectangle 12 than loss and one-short lack when To milliphres the open and of this tri-sagio described, there shower strips are more weeded across the one-eighth lavis specing from the upper to the lower

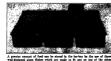


With this alarm the naise ng ice-but pay can be all nated





biention of tell-light and apot-light









to be cut to fo

CONTRACTOR ASSESSED

A Novel Rear-Lighting A Wiffli the very prosent use of "etap-lights" designed to inhere the driver behind when the ran absold is going to slow down, turn out, or do star-tishing size different from continued pa-cess in a straight like at uniform ve-

this can different two notificing pre-licity, there have been transvers therein, there have been transvers therein, which is the second of the con-cept of the control of the con-cept of the control of the con-position of the control of the special with the control of the product with the control of the con-trol of of th erpearance of this assembly

A Simple Device for Driving Tacks

THE tacker shows on this page is function desire that was designed to take the place of classes and inefficient trob.
This machine is pearly automatic to its action. All that is accessary to drive a tank is to place the needline over the desired spot and to press fown the their place of the trobal and the press fown the tricks placed ands. The backs, which recily are not tacks at all has seasi-stagles about one-half lock wide with teach one-quarter hash lang, are surried

is a set of magazine at the bottom of the turber. This ranguaine, helding this of the "tarks" is kept in place by a coll spring which at the same time paskes the ranguaine forward as the "terlor" are There is nothing complimated about It and a freek supply of techs can be in

world to a few weeps time Automatic Release and Rehitch for Tractors A DESTREE for the last steep ground in A connection with tractor plowing is letter reconfluctured by a Wisconsta firm.

This device is always in connection and is estimated anomatically by backing the fraction in celebration. When the place makes any with a real solutions a constant appears in contraction and the place meets up with a real solution at content appears in expanded. characters a tracket notice is against the and a review and is presented to singuis. This troping persons the dre-tor on the litting of the raise contact received the singuistic contact whitever the shifter contact. The fitting contact after shad on a beam, following the tractor. A chain consecued to a put the tractor. A chain consecued to the theorems because it is paided; and the clutch being released the tractor is successful. The cities have been a supposed to the contact of the contact the contact the contact of the contact the contact the contact the contact the contact of the contact the contact contact the contact the contact of the contact contact the contact contact the contact contact the con

The clotch zone as more clotch lever for preventing. The clots are increase the distance the increase and the piper but re-man, specing in order to keep

n sa sa sakibi



A device which keeps the foundry tree happy

The Crucible Pouring Device HAVE you over watched fromdrymen bounds or seen A L points credible by lead or seek deep carrying being credible of militan deep carrying being continued to a peculiar the contents patiently lists peculiar to the carrying content of the with back slooped over They from the property of the carrying con-templated by look too much list-terage to the carrying carrying carrying they maintained a best-over position they maintained a best-over position they maintained a best-over position they maintained to the working day and took half as here at light to write the lists not of clark backs. The modern creating passing devices the content of the carrying the carrying which we lither the maintained in the carrying the which we lither the maintained in



Port Westingen, Win, and was deor wattights, wit, all was to-gard to keep the kinks from ever uiting into the foundryman's back. He-re the introduction of this ext of ap-lates there, four, and sometimes flow a were offen required to carry and or a crucible. Now this labor in illustrated. One man curries the cruci-le—or rather, postes it along an over-end trolley which holds it up. Another lifting it when providery.

Kalifornia de la como de la



est strip of measural meally self-ring trensport the pouring device from the master to the pouring respic. When formers to the pouring cross. When the cracible is 'pulled' from the fur-tion, it is set fate the pouring shall which rests on the floor, and is giftened. Then it is teled to position and insect about on the trolley for the pouring

A Giant Tractor

WHEN one deals with mechanical feaths of the modern age, the tra-tor illustrated on this page must come in an candidate for very intensity men-ion. If the earlie offered by the presents of two human figures in the picture is



Not restricted to give an idea of the size of the markins, perhaps smoothing at the desired the markins, perhaps smoothing at the sideal by the meta-trans that there he sufficient deseases on a fixed out to man sadder it, from deer the straidile of the transactive verigin to the switzent load, and does the work of several transact at these in the childrents length group the valid it was appealing built. In whether the children is built group the valid it was appealing built. In what the children is children from any of the latter

ready to announce his picture, "The I rec Borne," a story of the transcentinental red builders new playing at the Lyric Theater, he contracted with two airplane excepts to applement a larray of newspaper and billhoard publishy. Plane with electric letters between the fuelup, nanoncing "The Iron Horse," were sent out. Horse," were sent out.

A switch control reachies the figur to find the sign on op off, yo be passed over

wheels have a distractor of ten feet. No that both most be of great magnitude.



st which permit the miscel How to Utilize Old Safety-Race Hlades

A New and Startling Method of Advectising WHY three away year old rater blacks even if they have been se-sharpened? There are many tases to which they can be put if the proper EVEN bland Broadway was started to when it started up beyond the plant of its white lights to see a great electric admentation alone forther when at the main rising sign flying whole at the rate which they can be put if the proper holder is utilized. One holder events of a pair of brass plane fidded tagether and ecured by eletted robes. Big an old Gliette type hade over the ruled, punched holes and severe ir with the takes. Yes now here William Per, New York meter pic-ture producer, was the first selection pic-ture producer, was the first selections in the world to adopt this novel method of reaching the public. When he was a splended outlier, scraper, allow or firsteversi types of believe, the use of wh will make highly efficient tools,

By the use of this play a war

to can be imme in elecul

"Plog a Plog in a Plog"

A Napoties ratio plug for connect.

A lang heaters and instrument to a ratio set has been developed by a Padite Const ratio summirrante. The use of this plug enables additional head-sets to be connected to the radio receiver instantly without the involvenme in size no larger than an ordinary play this device contains in itself a se juck so that the mere inserting of one plug in another connects the circuits in



ed of letters ten and a half fest does, the whole sign being farty-one feet wide. It centains 500 bulbs of twenty-one cardio and the state of the middle dynamic to feed the building which are carried in front of the midtle seat.

The Heavens in December, 1924

Interest Centers Around Preparations for Observing the Coming Solar Eclipse By Professor Henry Norris Russell, Ph.D.

Ill attention not only of autonomers, but of the powers public, is centered this winter upon the country selpes of the sm. Although II does not begoen until next month, there is no much to be said that we may well begin now.

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Religion are constant enough affilies. At least twice in every year the most passes between the earth and In every year the most passes between the earth and the was not movely entangle to like the observer at least some part of the senite disk for observers situated somewhere on our planet. Although the moves is so much smaller than the earth that she extend this the san, even partially, from the whole fore of the earth at once, she does get in the way for any given terms-trial station forly three or more in a century. Everyone who cares in the least to do so can see a solar But a total solar evilence is a very different matter. To begin with, the mean number be heaver to us them the

everage, so that she may look higger than the man, or, to get it etherwise, so that her shadow, (which tapers to a notet at the distance from which the most would look as hig so

This begoons, on the average, rat This hippoint, on the average, believe more than once in two years. But if the point of the abackow havely reaches that earth, it will be so narrow and will pass over so quickly that few observations can over so quarky that you insecutions can be made. Allowing for this, and for cases when the shadow post falls in the point regions or on the awar, there remains a total eclipse overy three or four years, an eclipse which can be observed if one gain ir enough to see it. But an enimous where the moon's shadow

But an eclipse where the mean's shadow passes over a densely populated region habited by millions of rivilized people to decidedly rare, although the intervals be-tween such owners are very irregulat. The last total celipse risible in New England, last total ordine risible in New Regions, for example, happened on June 28, 1984. After the 24th of next January, however, only news purson need edges, until Aggret 31, 1962, attelber ordiner into be need. After that, we must wait until 1926, when the ordine with over just at tise and hardly worth observing. On the present acrosion circumstances are less furtured than in 1805—when totally business may been of a sunmer's day-but are favorable causes to justify crossiderable preparation by anterior grand considerate proportion to prove orners and a wide-spread public interest. The path of the shadow is between 100 and 110 miles wide. Hearting the earth first, on the sources edge, in Northern arts. It express arrives the western bay of Lake Nuperior, just grading Dra

leth, and over the region near the Wheve-sin-Michigan boundary. Notiter here not on the south-ern peninstar of Michigan does it pass over any large cities. Bey City is seven after seets of the obscured none. Purt Huma twenty, and Dennit seventy-des-creeding Lake Huma, the shadow incremes the pe-naturals of Onize's, Hamilton being very near the contral line and Toronto for table habite he northern

the shadow present close to Bullion, the regional line of the shadow present close to Bullion, Watkins and Bing-lagatest, New York, groups the nephrostern corner of unia, crosses the Univer about five niles north of Newburg, goes clew to Denkury, Connecticat, and over New Heren in the same state. These it passes out to see across Motivak Print, Long Island. The northern itself of the shadow roses a desert till porth of Rechester, eight rolles with of Syrnesse, at an equal distance north of Hudsel, two talks seeth of ringfield, Manuschmetts, right over Precidence, ode Island, and five collect meth of New Heefferd, associated to. The seathern boundary of the shadow see ten miles worth of Dunkirk, New York, five as aceth of Owns, five miles north of William Berro. Pennsylvania, eight solles north of Structeburg, Penn-sylvania, and right arrises the middle of New York City, the concepted limit blaceting Munhattan Island

Is the viriality of Central Park. A map of the ediper track was published in the Scinytillic American for Newsdow, 1826, or page \$12. Immunitable others will doublies be published elsewhere. The duration of the ordiger varies from a minute and The destrict of the origins make from a status and forcy can seconds in Bridgas as to minors and then provide a Martinik Police. This is long mough to possible as a Martinik Police. This is long mough to possible as a finish to make longer and the sightners to love this fill. Every case will be an early riser that assemble, the the drilling mount of tablectipes crosses at 50% a.m., at Buildo (Martini Segland) them, 5000 or Hingshoot, and 50% at Nagland; them, 5000 or Hingshoot, and 50% at Martini Politi. This makes the speed of the shader shader as set in second. This is preser them that of the shader shader as set in second. This is preser than that of

surface very obliquely, and its rate of progress over the lated is much growier than the rate of its lateral advance in space. All these circumstances are favor-able for observation, but the low altitude of the man, only about 18 degrees in New England and

Art ridest: Jun 1. Art for rises; Jun 14. At 10's which | Dec. 1.

The number will not be much bettered, indeed the usual paner may be glad that he does not have to metch his neek to looking marry comband. But the stretch his neck by looking pearly overhead. erects his hest by issuing hearty overhead, and the worker with the telescope may be trushed with the had "medig" which is encumiered when the sun's new have to follow a long stanting path the togs to make where. This effections and the large corrections for piece. This disturbance and the large corrections for referrition while on interhalina in the cellistion make the powers oversim devicing informable for naking further piecessing to investigate the Einstein disk-ticution of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the color over years appear having applied on a before the but the control of the control of the color over years appear having applied in such to close but the control of the control of the con-line of the control of the control of the con-line of the control of the control of the con-trol of the control of the control of the control of the con-trol of the control of the control of the con-trol of the control of the control of the con-trol of the control of the co Activate restrict free place to place, are menty over.

A 50 percent classes to see so magnificant a spectacle
as a total relipse is well worth taking.

The risk of had byth with the weather in metors

The fifth or man open want the weather or memory and the between, to call down the programs of the automorphes to modest dimensions and one. The meanly protographs of the sector will be used, with instruments of all since. Bjectmanufer observations, both of

the Indocurrent and of the souns, will be it offer on the last of these of comments of the original and these of comments of the original and the comments of the original and the comments of the original and the comments of the comments o

The Baserous De Marchael Committee of the Marchael Committee in good in the legislation and the legislation of the Marchael Committee in the Marchael Committee of the Marchae

Moreovy is an evening star for most of this recent and is in elementor, nearly

21 degrees from the sun on the 9th. He is so far south that he sets early (5:45 is so far south that to sets only (5:50 r.m.) but, even so, he may be wisthed in the twilight. Later in the month he frames rapidly in toward the san, passes through conjunction on the 20th, and is

and 5:00 a.m., and very conspicators. Mars has shroul to less than a trait of the heightness to August an will be more than a handred million talks away before the year closes, but he is still conspicuous. On Christ max Day by is in quadrature, east of the sun, and is due south of 6:00 fex. now liver by the construction, not of the exec, and it is a property of the construction of the constructi



SCIENTIFIC AMERICAN

Recently Patented Inventions 16, to will engine of any patents batch borns for 21 counts and. The object special coins of patents between for 21 counts and. The object special coins of patents between 50 counts of the counts patent of the c

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Pertaining to Accounting Moyamas Annia, Whinis Tracmo- That may be drapped from airmust new target that are out of their vertical re- seem at a great distance. Passes 250817. 0, & Oreces and & Guident on Labouretta, Tin Due Hacelli 21, Bern. Italy.	pucket size tokense time. Patent 15049C	Mr.ru ron Manroy Casts-Dy messe of	On Can-By means of which the old m
That may be dropped from aircraft open	A. C. Lott, Not 400, 12 Part, Treas. Preparation Device—Aducal for mark-	which a cust may be readily made of the	he forced therefrom irresportise of the pu
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D. A. Crocce and A. Guideni, c/o L. Lebecortta, Tis Due Marelli 21, Rome.	ing clerks and drafts so that their com- mercial value easest be altered. Patrol 1504091. K. H. Borland, Cape Vinesat,	Water St., Milwacker, Wis.	Consume With means for femily on
Italy.	N. Y.	Gasta Manage—For the Mentdension of the document, the decise is densite and un- changed by the elements. Paints 1504308. J. M. McColl., 2015 Main Eq., 80, Joseph.	more or above flat surfaces. Patent 130760
Electrical Devices	Winter State-With elitate that su-	changed by the elements. Plantz 1504365.	Rose C. Simes, 382 W. 198th St., No.
Linerous Ferrom-Which is portable,			
and may be supported upon a table, or other pended from a seeiing or well. Person 1805, 178. A. Hazano, o/o Destinion Motel, Globe.	of the wind. Peters 1508700. T. J. Mann. Literature, Tonne.	CHARGE MARCE EXPER AND COM-	movable such is prevented from any later
778. A. Hazaro, o/o Durinian Hotel, Glabe.			
Arisons.	prevenes of a mit-case when fields, and	Patrict 1900132. W. R. Derry, For 066, Augusta, Ga. Dannerso Challs—Wherein motes are provided for the holding of wearing apparel.	
Mrs Actuated by the usual electrical cur-	etz. Patent 1502714. N. Schalpper and R.	Description Character Wheels meets on	Ratevest Cass-Of the collapsible try which may be reality knocked down whe set in use. Putent 1906291. C. E. Barri 211 Barber Bidg. Brattleboro, Vt.
weeking and mopping from Perme 1505.	Bredy, 225 H. 119th St., New York, N. T.	procided for the holding of wearing apparel.	set in use. Putent 350050. C. E. Barri
rest installed in a feedling, subpred for both washing and mapping faces. Parent 1505, 166. J. M. and J. C. Knier, 1216 18th St., Bock Island, III.	Than-For catching rate and other ver- tels, the trap is easily balted and auto-	and supporting the first to lase or pulleb shoes. Pattert 1505609. H. W. Watterder.	
constants Asserting make his res Whatese Philipparty—for heading bresspre at high speed, and also diminating the "seed to receive" transmitter switch. Palant 1906050. H. E. Haffberg and H. B. Miller, 24 Marchin Ave., Upper Montriatr.	Blanc on Vanny Casta-Re name of	TRENER WARRER DEVICE—Providing a gestable bessing adapted to elevate a genera- nel meditio per above a treath. Project 1505108. C. E. Spechawk, Deutschler, 43- horts, Connis. Porturer Breating Apparatus—While.	& Tuesd Co., 600 Redner St., Brookly
the "send to receive" transmitter switch.	which two covers may be secured by the	and markins gen above a trench. Patent	N. Y.
Patent 1000000. IL M. Hallberg and H. R.	Kendell 115 Market St. Named N. C.	herta, Canada.	MEANS FOR REPPORTING VACCOURLED THE RECTLES OF OTHER RECEPTAGE WITHER INCLUSION CARRIED THERESE—1
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Spectacor Deriscons—Arrangel to de-	folloge, the sections when connected giving a	will automatically apony the positry during their extremes or exit to the positry house. Person 19764cl. E. D. Bordrickson, 1911 S. Och Sc. Seantle, Ward.	spring treathers adapted to support the lo
fact part of the light at any decired sugle without shotting of the usual spot. Patent	Marshall, 1765 12th St., Detroit, Mich.	Perent 1966el. E. D. Berdricken, 3112	temper of the bettle both internity and five hore. Patret 199000. E. Urbaha, e.e.: Schwanterley, Konlgystaevet 50, Bed S. W. 13, Germany.
1506727. F. P. Remps, 2003 Carpenter Ava., Breez, N. Y.	Sany Source-Easily set up to hold sight	F. 66th St., Seattle, Wash,	S. W. 11. Germany
	sign is to be necked for abinuses. Person	With means for keeping an equal distance	Hardware and Tools
one of water is automotivally mainteled, decort the modium of an electric baster. Patent 1500870. J. Shakan, Gadelon, Ala.	1500000. C. H. Luch, n/o Beacon Mile and	Dratter was District Name. Dratter was District Paracters Lives— With means for keeping an equal distance between the lines to be drawn. Pubmit 1905, FEE. G. D'Eneme. Via Galbei 27, Roses, Italy.	Nav Ser-Sy rease of which the tee
Patiet 1500870, J. Shakan, Gudeles, Ala.	That Canten Which webs it results	Italy.	of a cross-cut new run be quickly and sant set. Patent 1000200. C. A. Hansen, Wann
Prince 190800. J. Shakes, Genfeler, Ale. Samp-Chardina Design — Electrically fetres, by any collings source of cerestry, designed for beamfold use. Patent 150000. E. Walser, 122 Frenklin St., Union 1821, N. J.	These Camers—Which makes it possible to easily unless a trace, at the same time prevents socificated uncompling. Puters 186400. S. C. Krenn, Mundall, S. D.	Campor-Herizz seed quildes members	ort. Patret 1505290. C. A. Hanson, Watts Oregue.
derigned for household use. Patent 1509/90	1804000 F. C. Kroom, Manufaid, S. D.	disposed at the source and the botton. Put- act 196030. C. Lethretin, e/o National But & Lumber Co., 350 South St., Newark.	
R. Walser, 122 Franklin St., Union 2013,	HANCES AND STROPPENS DEVICE - By	Ret & Lember Co., 320 South St., Nevert, N. J.	opened in the durkness, the combination is one reducted by dustinet clicks produced in
crickly released without the use of any- scale. Patent 1507194, W. A. Miller. R. F. D. No. 2, Beaver, Pa.	cally without removal from the decise. Put-	of the bottle, of durable construction and	Rembral, 3205 St. Ann St., New Orlean
R. F. D. No. 2, Beaver, Pa.	Gastronale. M. L. Chesps, Gratemate City,	of the bottle, of densitie construction and multip factured to the sarkey. Parent 1965. 200. C. Leftereits, c/o National Sea & Lomber On. 350 South St., Newerk, N. 2.	Portone Can Orenza-Provided with
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Propugatory Laup-Is which the fin- ment is supported in a straight line eched- dest with the longitudinal axis of the lawn- prisent 198602. C. O. Schwar, 35 Inst- femald St., Thomato, Canada.	up in hells or other comparationly small plants. Pubmit 199871. P. J. Pollaick, St.J. Buskwick Ave., Brooklyn, N. Y.	a morphasin for may se used in arbests. Dat-	
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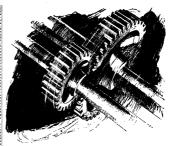
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LEAD gives to chinaware its beauty and lustre

CLAZED chins is nothing more than clay shaped in various forms and covered with a thin skin of glaze. It is this thin coating that transforms the this thin coating that transforms the rough porous clay body into a beautiful, smooth, lustrous chima plate or cup or succer. And in making this glass, lead has always been one of the most essen-

tial ingredicts. For tworty ensuring pottery has been coated with lead glazes. Green pottery made in Clinia during the Has dynasty (909 B.C. to 400 A.D.) here a lead glaze, as did the pottery of the ancient Asyrians and Egyptians. For hundred of years Europe and every country inflament by European civilination have used pottery made of common city covered potters.

ered with lead glasses.
At the wery beginning of the politary industry the desirability was recognized or using the lead products—white lead, red-lead and lithauge—in the manufacture of fine chinaware. With the growth of the industry there acces the neef for the manufacture of these lead products by companies, such as National Lead. Company, from which the pottery maker could depend on getting white-lead or red-lead or litherge of the required purity and fineness

Quantity of lead used

Today many throunds of pounds of lead are used every year in making both transparent lead glazes for fine china-ware and helliant, glossy opaque examel glazes put or sanitary bethroom fat-tures, assuming pool, bathroom and hitchen tile and ornamental tile. In conction with enamel glases on sanitary are, potters my that those with a high percentage of lead

adhere better to the motal base and are less Any one of the time og woodes and other non-metallic surlikely to crack.

lead products, white-lead, red-lead or lith-arge, can be used in making lead glazes. But potters usually perfer white-lead for the finest and purest results. Red-lead and Rharge, however, if absolutely pur make just as white a glaze as white-lead Makers of fine chinaware will use, as dees one manufacturer, as much as 80,000 pounds of white-lead a year and only 1,000 pounds of red-lead. Others in industry use large quantities of red

The place on the object material had. The slay hely to amond with the place material of it thro hedred to a high temperature to fix the place. lead. They will reverse the above figur and use many times as much red-lead as white-lead.

The use of lead point A LTHOUGH lead in pottery is con-stantly serving and helping to beauti-your home, the tonauge of lead used ry year need, the unimage or such that in this way is not so great as that used in paint. Everywhere you go you see achir-lead point protecting houses from the attacks of weather. For generations the professional painter has used white-lead to save the surface. From our forelather' time it has always been the standard for bookstoer, write the pr

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Air hearing Assessment sucking Street and Copper auditor Street and Copper auditors and Copper auditors and Copper auditors and Copper American Street and Copper Street and Copper Street and Copper Street and Copper Street American Street Copper Street American Street Copper Street



~is rapidly becoming

The housewife has long known and appreciates the marvel of electric heat—t irons her clothes, boils her coffee,

makes toest on her table and coo dinner.

The men who own and open numerable shops, mills and factor

realizing, more and more, what electric heat is doing in industry.

In thousands of places it is helping to solve first problems and improve quality of product—because it can be uniformly and automatically controlled. It is perhaps the most striking contribution of electrical science to industry

tribution of electrical science to industry since the development by Westinghouse of the alternating current motor. Note the amazing variety of its uses listed at the left and ask yourself—"Am

the application of this new electri giant to my industry?"





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